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See page 4

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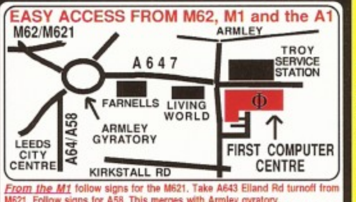
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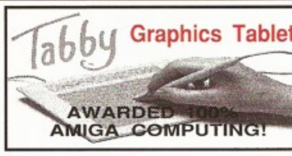
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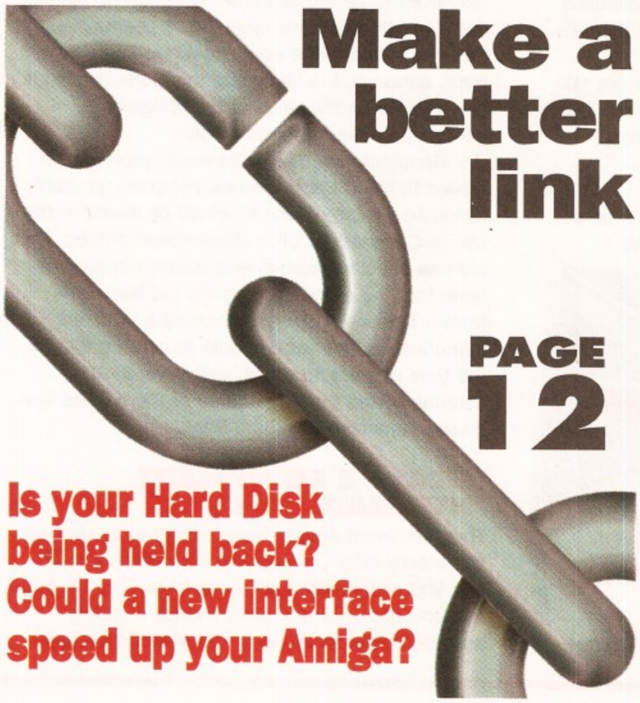
AMIGA SHOPPER DECEMBER 1994 No 44



Good evening and welcome to the world's most fabulous Amiga magazine! Every month we bring you, the serious Amiga user, the stuff you need to know. Want to know which Hard Disk interface is for you? Turn to page 12. Do you feel a need to learn how to program in Assembler? Turn to page 56. Want to find out the meaning of life and the purpose of existence? Turn to page...

Oh dear, we seem to have run out of space. Never mind – maybe next month...

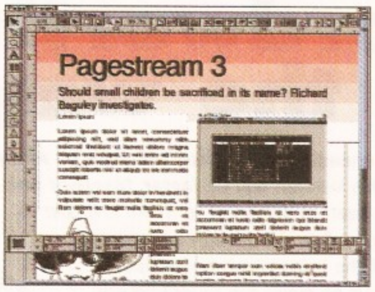
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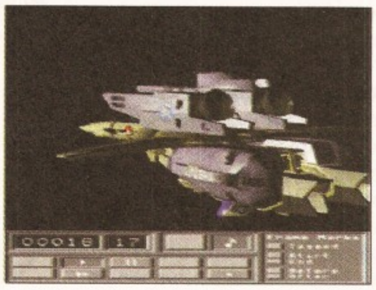
Make a better link

PAGE 12

Is your Hard Disk being held back? Could a new interface speed up your Amiga?



We've all been waiting for years for this program. Now it's finally here, but it's still not finished! What on earth is going on? Turn to page 20 to find out what the situation is with Pagestream 3.



Could the Animation Workshop revolutionise the way you create your animations? Turn to page 19 to find out.

FEATURES

HARD DISK INTERFACES 12
Could a new Hard Disk interface revolutionise your machine? Should you go for a SCSI or an IDE drive? Mark Smiddy investigates the alternatives for all the models of Amiga.

PAGESTREAM 3 20
After a wait of over a year, it's finally here. But it's not finished! Richard Baguley takes a first look at one of the most eagerly awaited programs ever.

REVIEWS

ANIM WORKSHOP 19
Can this program change the way you produce your animations? Graeme Sandiford investigates the latest version.

PROGRAB 24RT 24
Will this new video digitiser.clean up your video grabs? Graeme Sandiford investigates the very latest word in real-time digitising

TURBO CALC 28
Is it time to change your sheets? Graeme Sandiford investigates the latest version of one of the Amiga's best spreadsheets.

VIDEO BACK-UP SYSTEM 31
With completely rewritten software and a whole bundle of new features, can this innovative Hard Disk back-up system keep up with the times? Richard Baguley gets secure.

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Things finally get moving in our Chess tutorial as Cliff Ramshaw shows you how to determine how pieces move.

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Dave Winder examines the tea and cheesecake at Cyberia – the UK's first Internet cafe.

MUSIC 69
Tim Tucker (ex-bass player of Cactus Rain) looks at how you can get a full orchestra into your Amiga.

C PROGRAMMING 72
Toby Simpson adds a graphical front end to our file finder utility.

AMOS 78
Simon Green reveals a few more secrets of the AMOS professionals. This month it's scrolling and fun with mice. Eek!

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We've got five ProGRAB 24RTs to give away! All you need to do is answer a few simple questions...

AMIGA SHOPPER

All you'll need to get the best out of your Amiga

No sale yet for Commodore

Final decision expected soon. Commodore UK bid still in the lead, but a surprise German bidder enters the fray.

Once again, there was no news at the time of going to press on the Commodore sale. One of the bidders (Alex Amor of Florida-based CEI) said in an on-line conference that a decision was expected towards the end of October, and David Pleasance said that "we are now just a short time from a successful completion date".

At present, there are three bidders involved in the process, and the late bid of a third party (the German distributors Escom) has stretched out an already lengthy process. See below for details of the various bidders involved in the process.

The Commodore liquidation has been an *extremely* long and convoluted process. It has not been helped by the extremely complex structure of Commodore, with a variety of partly and wholly owned subsidiaries, and a large number of loans and similar deals with other companies.

The liquidation left a number of very angry creditors, several of whom tried to get the liquidation proceedings moved from the Bahamas (where Commodore International were based) to the United States, where they would have more influence over the proceedings. Under Bahamian law, creditors only have an advisory role, but American law allows them much more influence over the outcome of the winding-up procedure.

Add to this the seizure of the main Amiga manufacturing plant in the Philippines by the Filipino government in lieu of back rent, and you begin to understand why the process has taken so long.

It now appears extremely unlikely that any new Amigas will be available for Christmas, although there are possibilities that some existing stocks will be released once the final details of the sale have been settled.

Meanwhile, limited stocks of Amigas are still continuing to emerge, although they are not in the sort of numbers that dealers are requesting.

THE CONTENDERS

The Commodore liquidation and sale is a rather confusing business. The following are the people bidding for the remains of Commodore.



COMMODORE UK

This bid (headed by Commodore UK directors David Pleasance and Colin Proudfoot) is widely perceived to be the favourite. Although no specific details of the bid have emerged, it seems likely that the Amiga range would continue in its current form, although it is likely that the marketing would concentrate on the value of the Amiga as a general purpose, family computer.

Manufacturing of Amigas would probably be moved to the UK and the new company (probably called Amiga International) would be based in the UK, at Commodore UK's Maidenhead offices. This bid has popular backing, and recent rumours have been that the money behind the bid has come from a Taiwanese source, possibly a PC clone manufacturer. We were unable to confirm this at the time of going to press, and several other sources hinted that the source of the finance was a large American Merchant Bank.

CREATIVE EQUIPMENT INTERNATIONAL (CEI)

This prominent Amiga dealer mounted a surprise bid shortly after Commodore International went into liquidation. Although many favour the UK bid, this one does stand a good chance of being accepted. The chairman of CEI (Alex Amor) has

Wordworth 3.1 on the way

Digita have announced that they will soon be releasing Wordworth 3.1. They claim that this version will be faster, friendlier and generally easier to use.

It's also been re-designed to make it easier to use from floppy disk. This major upgrade will also fix all of the bugs which bedevilled release 3.0, or so claim the programmers. We'll be doing a full review as soon as we can get hold of a copy. Digita are on ☎ 01395 270273.

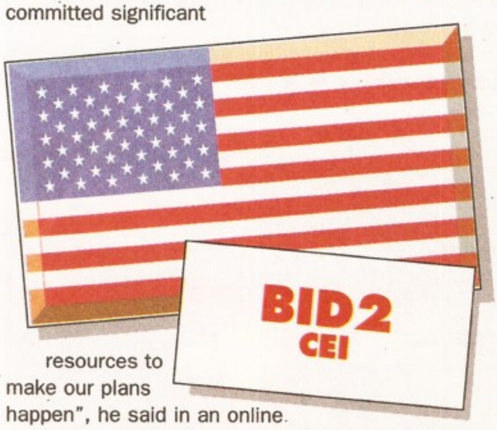


In an unrelated move, Softwood have announced that Version 3.0 of Final Writer will be released shortly.

This upgrade to the top-rated program in our round-up in issue 39 contains a range of new features, including Drag and Drop editing and real-time spell checking. Once again, we will be doing a full review as soon as we get hold of a finished copy. Softwood are on ☎ 0773 836 781.

many good contacts within the industry, and has been talking recently about how several prominent Amiga based companies are behind his bid. CEI have been heavily involved with Amigas in the past as one of the biggest distributors of both Amiga computers and peripherals in the USA.

"The group of investors who are backing our venture for the acquisition of Commodore have committed significant resources to make our plans happen", he said in an online conference on the American E-Mail service BIX on the 5th of October. In fact, Amor is so confident he will win that CEI recently put a series of ads in newspapers in the Pennsylvania area for engineering, accountancy and general staff for the new company. The new company would probably be called Amiga Technology International, and the marketing of the Amiga would be based around its creative potential.



"I do not expect the Amiga to become a replacement for PCs, but to fulfil a specific niche in multimedia, video editing courses, arts and music." said Amor. Manufacturing would be moved from the Philippines to the USA and Europe, and there would be regional offices for the new company in the UK, Germany and Italy.

Their initial plans include getting the A4000T out into the market, and producing a new version of the A1200 based on a 68030 chip. "By getting the Amiga name recognised as the ultimate graphics machine, the machine will blossom into new vertical markets", Amor said on BIX. The investors behind this bid have not been revealed, but there has been much speculation over whether companies such as NewTek (the manufacturers of the Video Toaster and the excellent 3D program LightWave) and Scala are involved in the bid. Alex Amor himself was not willing to comment on who is behind his bid.

ESCOM

A late bidder for the remains of Commodore International is Escom, a German distributor and manufacturer of PC clones and peripherals with 242 stores across Europe, including 24 within the UK. They have no connection with the Amiga as they mainly specialise in PC compatibles and peripherals. Although we were unable to confirm the details at the time of going to press, it seems possible that some employees of the now defunct Commodore Germany are involved in the bid, including the ex-Chief Executive Officer Alwin Stumpf.

The ex-General Manager of Commodore Germany Helmut Jost also joined Escom in 1992, so there will definitely be some inside knowledge of the Amiga market within Escom. No details of their bid or their marketing strategy were available, but it seems likely that they would want to concentrate on the European market, and would probably manufacture the Amiga in Europe.

Commodore Germany were the first Commodore subsidiary to reveal the existence of the CD1200 CD add-on for the Amiga 1200, and it would appear likely that they would want to follow a similar marketing strategy to that proposed by Commodore UK.



COMMODORE MANUFACTURING PLANT SOLD

Commodore's US manufacturing plant has been sold by the liquidator to GMT Microelectronics, run by George Giansanti.

This plant was where most of the Amiga's custom chips were designed and built, and the building still contains many of the machines designed for manufacturing these chips.

Giansanti used to be employed by Commodore as Director of Operations in the semi-conductor group several years ago, but left to start his own company.

Although this company is not connected with any of the bids for Commodore, Alex Amor of CEI confirmed that they were having discussions with GMT about manufacturing chips for new Amigas.

SORRY, NO READER ADS THIS MONTH

Due to circumstances beyond our control, we have had to drop the reader ads section this month.

This "the-one-and-only" place to sell and buy your Amiga kit will return next month, and we will carry over all of the ads which were scheduled to run this month. Apologies for any inconvenience this may cause, and please keep sending in your advertisements

Normal service will be resumed as of next month. Please do not re-tune your magazine.

A WHOLE WORLD OF AMIGA

If the Future Entertainment Show wasn't enough for you, then you'll be pleased to hear that plans are proceeding nicely for the World of Amiga Show, which will be held at the Wembley Exhibition centre on the 9th, 10th and 11th of December.

The show, which is being organised by Commodore UK, will concentrate exclusively on the Amiga, with a number of special areas such as the A.C.E. Village, where the Amiga Centres of Excellence (such as Ramiga and Premier Vision) will be showing the state-of-the-art equipment they sell and offering advice on any form of Amiga use.

The Software City games arcade will also feature all of the new Christmas games from the big software companies. There will also be an area dedicated to user groups – you can come along and find out which user groups could help you with your Amiga. And if all that wasn't enough, Kiss FM will also be broadcasting live from the show.

If you didn't manage to get down to the Future Entertainment Show, this could be your chance to meet the people who put together this magazine and ask them awkward questions as Future publishing will also be exhibiting.

There will also be plenty of stuff to spend your money on in the retail park area, and many dealers will be offering vouchers to get back your entrance fee if you buy something from them.

Of course, the question on everybody's lips is "will the new owners of the Amiga be there"? There is no certain answer to this one as of yet, but it seems likely that a decision will have been made by then, so this could be your chance to meet the new owners of the Amiga.

The show is at the Wembley exhibition Centre from the 9th to the 11th of December. The doors open at 10am and close at 5:30pm. Tickets cost £6 for adults and £4 for children. The ticket hotline is ☎ 01 369 7711.

BUYING FROM ABROAD

If you are planning to buy any of the overseas products we review this issue, please consult the buying advice section on page 97.

Buying programs or equipment from abroad is easy, but there are a few simple guidelines you should follow. The best way to pay is by credit card, as any currency exchange will be handled by the credit card company.

Alternatively, you can have money transferred directly from your account to the companies, although some banks will charge for this service.

If you are buying from a European country, most banks will be able to supply you with a Eurocheque, which can be paid into any European bank.

You should also make sure that you check that delivery charges are included in the price.

The Next Generation Image Processor

Almathera are set to launch one of the most interesting new Amiga products in some time. Photogenics, a new hybrid artist's tool, will be introduced at the World of Amiga Show on the 9th December.

Photogenics is a brand new artist's tool – it's a hybrid of an image processor and paint package which will be sold for £54.95. This means you'll get the power and flexibility of an image processor, combined with the ease-of-use of and artistic freedom associated with a paint package.

To run Photogenics you'll need an A1200 with 2Mb RAM, although 4Mb and a Hard Drive are recommended. This means that the program can take full advantage of the AGA chipset to achieve near 24-bit graphics quality. The display is in real-time even in HAM-8 mode, this will be a definite plus when using traditional art tools such as painting, chalk, pastel, pencil and air brushes.

Smooth Compositions

On the Image processing front, the program will have support for several graphics file formats, such as JPEGs and GIFFs. The program also makes use of alpha channels to facilitate smooth compositions and give added control over effects.

Photogenic's interface allows you to work on several images at one time by opening a re-sizable window for each one. Thanks to the program's open architecture, you'll be able to add your own effects, loaders and savers.

If you would like to find out more about Photogenics, contact Almathera on ☎ 081 687 0040, or check it out at the show.



Photogenics is a revolutionary graphics program.

Give your Book Collection a Boost

Bruce Smith Books have launched a new offer for this Autumn that, effectively, gives you a free book. They will be releasing a new Workbench 3 Booster Pack.

This pack will contain two books and a video for the price of a single book and video. The Booster pack costs £39.95 and will also include a floppy disk.

The pack comprises the Disks and Drives and Workbench 3 A to Z Insider Guide books and a new video, "A1200 – A Deeper Look".

The pack has been compiled with Amiga-users who, although not absolute beginners, are still relative newcomers in mind. It has been designed to follow on from where the A1200 Beginner's Pack left off.

The Disks and Drives Insider Guide explains how disks and drives work. As well as explaining how hard and floppy drives work, the book also covers CD-ROMs, the RAD device and even data encryption.

All You Need to Know

Workbench 3 A to Z Insider Guide is intended to be a quick-reference book that will tell you all you need to know about Workbench quickly and simply.

The "A1200 – Deeper Look" video incorporates animated diagrams and demonstrations to help new Amiga-users get to grips with their new computer.

The book is exclusively available from Bruce Smith Books, who will except credit card bookings, on ☎ 0923 894355.

Siren Software Show You How

From now on, Siren Software are giving away a free "How To Fit Your Hard Drive" video with every A600/A1200 hard drive they sell. The video takes the watcher through installing the drive in a step-by-step fashion.

It's intended to enable anyone to fit an internal 2.5-inch IDE drive to their A600 or A1200. Normally the video would retail for approximately £14.99, but it's being given away entirely free with every hard drive bought, even 30Mb ones.

Siren Software currently stock IDE drives of the following capacities: 30, 40, 60, 80, 120, 170, 200, 258, 270, 344, 405, 540Mb. The drives cost between £109.99 and £449.99. All of their drives are supplied with the necessary cables and screws, partitioning software, Hard Disk Stakker to increase the drive's capacity and a 12-month warranty.

To place an order, contact Siren Software by phoning ☎ 0500 340548.

Beat the Amiga Guru

The Amiga Guru Book is a newly translated version of German Amiga-expert Herr Babel's book for programmers. This mammoth 736-page book is aimed at all serious Amiga programmers, regardless of which programming language they are using. It will be available from Almathera for £35.

The book covers just about every aspect of the Amiga's internal workings. It explains how Amiga C compilers work and provides guidelines for proper multitasking programming. It also goes through peculiarities of programming in C and Assembly on the Amiga. It also explains how to use Amiga specific features to make your code more efficient.

More advanced programmers will find the sections on ROM-Wack, Amiga.lib and debugging techniques useful. They will also be happy about the coverage given to explaining how to program boot blocks and create reset-proof programs.

This book really appears to cover all of the most fascinating techniques and procedures that every Amiga programmer is likely to need. At the moment, the book is only available from Almathera on ☎ 081 687 0040.

Wizard Launch Budget Drive

Wizard Developments have just released a new external drive for the Amiga called the Saturn. The drive only costs £49.99 and is compatible will all Amiga models. It's based on a Sony drive mechanism and features anti-click technology, switchable anti-virus protection and a 2-year warranty.

The company is also supplying two low-priced mice. They are stocking a mechanical mouse with a resolution of 400dpi for £9.99. They are also selling an optical mouse for £19.99. To find out more about these products and others, call Wizard Developments on ☎ 0322 272908.

On The Move...

Golden Image (UK) are moving office to: 65 Hallmark Trading Estate, Fourth Way, Wembley, Middlesex HA9 0LB.

Their sales hot line number is now ☎ 081 900 9291 and their fax number is ☎ 081 900 9281. The company has also got a new range of products, including two massage products.

Moving CD-ROM

Moving Textures 100 is a new CD-ROM that every animator will find of interest. It contains 22 real life texture sequences that can be incorporated in your animations. Each sequence has between 300 and 900 frames. They are a mixture of 24-bit, 8-bit and greyscale images. They cover such things as: boiling water, fire, steam, moving clouds and waves. The disc is available for $235 from Anti Gravity products on ☎ 0101 310 393 6650.

Puma and Panther set to Pounce

Texas-based Paravision have just finished work on two new Amiga-based multimedia stations. The Puma 020 and Panther 030 combine the multimedia abilities of the CD32 with the expandability of big-box Amigas. They cost $2,511 and $3,483 respectively.

The machines come with additional serial and parallel ports and the Panther has three Zorro II slots and a video slot that can house a Video Toaster or Opal-Vision Video processor. To find out more about the products or how to become a dealer, call Paravision on ☎ 0101 214 644 0043.

TALES OF DIGITAL ANGST

Intangible Assets Manufacturing (IAM) have published a new video entitled "The Deathbed Vigil... and Other Tales of Digital Angst". It's a 2-hour long video documentary that has been filmed, narrated and produced by Dave Haynie.

For those of you who didn't know, Dave Haynie is the erstwhile Senior Hardware Engineer at Commodore Inc. and is regarded by many as being pretty "cool". The Video costs $40 and can be obtained directly from IAM.

The video has been produced and edited on an Amiga and shows the famous Deathbed Vigil Party, the Last Margarita's Layoff Party and footage taken at Commodore's secret engineering lab. It also includes interviews with several Amiga personalities and exposes plenty of "behind the scenes" goings on. It has been touted as giving an explanation of what may have gone wrong with Commodore and a chance to remember the best of what went right.

PROFANITY AND VIOLENCE

However, before you dive to your phone to place an order, please note that the video does contain a certain amount of profanity and scenes of graphic violence.

On a more serious note, the company has also produced a new book entitled "Connect Your Amiga! A Guide to the Internet, LANs, BBSs and On-line Services". The 256-page book contains information about networking your Amiga and getting it on-line. It costs $24.95 plus shipping and handling charges.

It's aimed at both beginners and more experienced Amiga-users. It explains what the Internet is, how to get connected and how to use it effectively. It also provides advice on selecting and using modems and communications software. It provides the reader with some understanding of how the Amiga's networking hardware and software works, as well as how to connect your machine to PCs, Macs and UNIX stations.

If you are interested in either of these two products, call IAM on ☎ 0101 610 853 4406.

CompuServe Continue Expansion

It almost seems as if the people at CompuServe can't sleep at night if they don't introduce at least one new service a month. This month they announced a new "What's On" service for the UK.

It's a guide to entertainment and cultural events that are taking place throughout the UK. The guide is updated weekly to keep it current and can be accessed by typing GO UKWO.

It contains information on art exhibitions, plays, festivals, dance, operas, concerts and other special events. You can find what you are looking for by searching for the event's name, venue, location or type of event.

CompuServe members will also be able to gain access to reviews of popular films, books, theatre productions, videos and even TV listings. According to the company's Product Development Manager, Andrew Burgess, there are also plans afoot to offer UK customers railway timetables, traffic information and, best of all, a guide to UK pubs.

NARROW THE LANGUAGE GAP

CompuServe have also just launched a new service that should help us communicate a little better with some of our European neighbours. The company's new MacCIM Help forum offers multilingual machine translation to automatically translate between various European languages.

Apparently the new system can translate from French to English, English to French, English to German and German to English. This is a potentially powerful tool for strengthening the links between European countries.

To find out more about the services mentioned, or to subscribe to CompuServe, call their sales enquiry line on ☎ 0800 289378.

ELSPA Beat Baud Bandits

After discovering a cache of stolen AT&T calling card numbers in a raid on the Living Chaos BBS in Northumbria, made by the ELSPA in June of this year, a trans-atlantic investigation has been launched.

The cards can be used to illegally make free calls to the states, which can last up to a number of hours, at AT&T expense.

This free connection to USA will give many European software pirates access to American pirated software. The joint investigation by the ELSPA, AT&T, and now the US Secret Services has so far resulted in a total of six arrests.

AT&T and the ELSPA are confident that the investigation has removed the main source of these illegal cards.

The Eagle Has Landed

If you are feed up with waiting for the A4000T, you'll be glad to know that NewTek have taken matters into their own hands. They are about to release the Eagle Tower 4000.

Essentially, you'll be able to transfer your existing A4000 to the Eagle's housing and gain seven extra Zorro slots, two video slots and several extra floppy drive bays.

To find out about this exciting new product, call NewTek on ☎ 0101 913 228 8000.

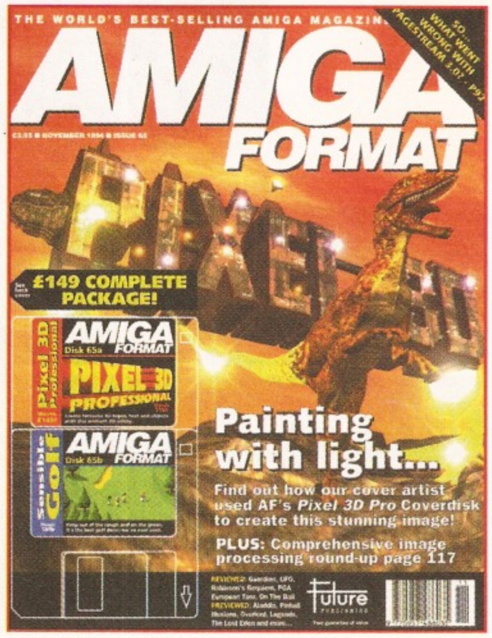
Meet our sisters

Although Amiga Shoper is, without doubt, the finest Amiga magazine ever produced, here at Future Publishing we also produce two other Amiga magazines. Here are the Editors of our sister magazines to tell you what you expect from them.



First off is Jonathan Davies, Editor of Amiga Power – **"Newsagents across the nation are buzzing with talk of the latest issue of Amiga Power. It features a review of Pinball Illusions, the Amiga's greatest pinball game yet, along with an exclusive coverdisk demo. There's also a Sensible World of Soccer demo, and a game called Suicide Mission. Inside are the much-anticipated results of our Readers' All-Time Top 100 Amiga games, and some terrific reviews of things like Guardian, OVerlord, UFO, PGA European Tour and FIFA International Soccer. Plus! We ask: In-game music – tool of the Devil? On sale now, where you hear the 'Bzzz'."**

And finally, we have Steve Jarratt, Editor of Amiga Format – **"Issue 65 of Amiga Format is, once again, filled with all manner of Amiga-related goodness. On the serious side, we've got a shock exposé on Pagestream 3 – ex-Ed Marcus Dyson explains just what went wrong with the latest version of the legendary DTP Package. On the games side we have such notable inclusions as FIFA Soccer, Guardian and UFO: Enemy Unknown. And, of course, Amiga Format's luscious coverdisks are, predictably, the best around, containing a demo of Sensible Golf and the full package of Pixel 3D Professional – worth £149!"**



Know what I mean?

Discover what the top industry figures really think.

Why is Toby Simpson angry?

I remember a lovely letter recently published in "The Edge" which made me both angry, and laugh heartily at the same time. A respected industry figure was having a go at, amongst other things, the C programming language.

He announced that programmers didn't want it, and didn't need it, suggesting that an assembler was all you required, as you can always write better assembler code than a compiler can. At least, that's what he claimed.

Unfortunately, he's misled himself. As processors and computers get more complex, it becomes harder and harder to justify writing code in Assembly Language. Not only does it take much longer, and it's harder to debug, but the result works only on one machine – it's unportable. In today's games industry, for example, being able to port code between lots of platforms fast is becoming vital.

To top it all, on a bunch of the most modern MicroProcessors, compilers can write better code than a human being simply because they understand the complexities of the processor better. It becomes "economically un-viable" to program such machines in Assembly Language.

C isn't that bad, its well understood and well written compilers can in general produce very efficient machine-code; with the added bonus that as long as the C code is well organised, vast chunks will be easily portable to another platform.

And of course, C is faster to program, easier to debug, and much easier to follow and understand by other programmers.

OK, so there are lots of things that C is not really up to on a machine like the Amiga, but in that case, only the time critical routines can be hand optimised in Assembler.

Programming games used to be very much like continually re-inventing the wheel. Modern games consoles (the ones that you read about in Edge that aren't with us just yet) have operating systems, like your Amiga's Kickstart, only a little smaller.

This sort of thing is there to prevent the programmer from having to do unnecessary work and make the job of software development easier, which benefits everyone – publisher, developer and the console producer. Gone are the days when you simply wrote directly to hardware registers, and treated the machine the way you wanted.

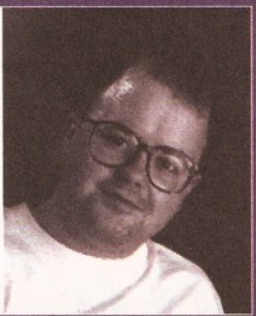
Metal-Bashing (as it's called) is a dying trade, some of the new consoles won't even allow you to write to the hardware registers.

Those programmers who are stuck in the past, a past of metal-bashing and blowing the OS out of the window in the first line of code, are highly likely to find themselves lost there, unable to compete in this new era we're moving into.



"Gone are the days when you simply wrote directly to hardware registers and treated the machine the way you wanted."

Richard Baguley talks about commitment



"I've been holding back the news pages in the hope that we could print a 'Commodore sold to Aliens!' story – but no such luck."

To be frank, I was originally going to use this space to talk about the new owners of Commodore, but once again no firm decision has yet been made. We've seen deadlines come and deadlines go, and still no final news.

We've been told on several occasions that "This is it! A final announcement shortly!", only to be told a few days later that we'll have to wait a bit longer for the final answer.

For the last few months I've been holding back the news pages in the hope that we could print a "Commodore sold to Aliens!" story, but no such luck. Hey, I would even have settled for a "Commodore sold to Commodore" story, or a "Commodore sold to *Somebody* (but we don't know who)" story, but no such luck either. Instead, we've had to put up with several months' worth of "Commodore not sold" and "Commodore – No News" type stories. Ho hum.

However, one thing has come out of this delay. It's proved that Amiga owners and Amiga developers are a persistent bunch who are dedicated to their machine. Some have taken this as their cue to move out of the market and some have gone bust, but most of them have stuck with the Amiga, despite the uncertainty and general confusion surrounding the future of the machine.

One video professional in the States has even offered to make commercials for Commodore at cost price, and the E-Mail networks have been buzzing with sensible (and not so sensible) suggestions on how the new Commodore should go about bringing back the Amiga.

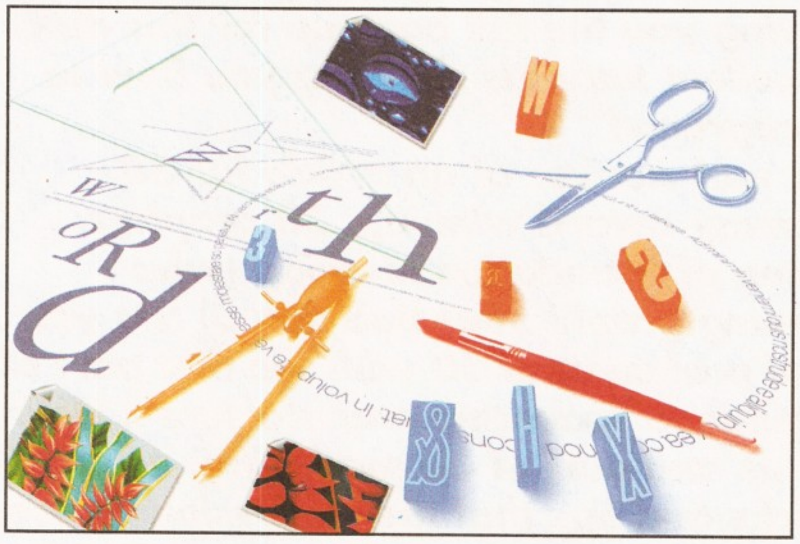
When the final decision is made, whoever takes over the Amiga will be foolish to ignore this resource. I've spoken at length to the organisers of the two main bids (Alex Amor of CEI in Florida and David Pleasance of Commodore UK in sunny Maidenhead) and they both seem to be aware of this incredible resource. They are both making plans to make sure that they use it if their respective bids are successful.

I'm not even talking about anything *that* fancy or expensive. All it needs is a regular supply of information to users, a good developers' program and some decent advertising in magazines such as *Amiga Shopper.*

Alex Amor knows about user and developer support because he's the head of one of the biggest Amiga retailers in the US, and thus has to deal with Amiga users on a daily basis. David Pleasance knows about it because he's spent a lot of time talking to users. Let's hope they know how to make the best use of the knowledge and put the Amiga back up where it belongs.

WordprocessinSuper printinNumbercrunchin LinedrawinPictureplacin TexteffectinDigisensinSpell checkinAutocorrectinMailmergin SpreadsheetinDragndroppinSuperspeedin

Wordworth, more than words can say.



In other words, new Wordworth® 3.1 is faster, friendlier, and even more powerful.

It's faster, like Find And Replace for example, which is now more than 40 times quicker.

It's friendlier, when you consider the advanced on-line help tutorials, intuitive editing and unrivalled technical support (after all, with more than 175,000 users, Wordworth is the Amiga's favourite word processor).

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Upgrades start from as little as £14.99, and if you use another word processor, you can trade up for just £59.

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NEXT MONTH

- **DevPac 3 Light Coverdisk**
- **Programming languages Supertest**
- **Ron Thornton's Guide to Spaceship Manufacture**

ANOTHER GREAT ISSUE, WITH ADDED DISK!

Next month will see the return of the Amiga Shopper coverdisk, with the excellent coverdisk of DevPac 3 Light, a version of HiSoft's incredible assembler package. This will give you everything that you need to get into writing your own assembly language programs!

We'll also be giving you the full back-up for this disk, with our usual excellent tutorials showing you how to write your own programs!

Plus, we have a real stonker of an article for 3D graphics artists. Emmy-award winning, 3D graphics genius Ron Thornton of Foundation Imaging (who produced the stunning graphics for Babylon 5) lets you in on the secrets of professional 3D with the first part of "Ron Thornton's guide to spaceship manufacture". He'll show you all the ins and outs of 3D modelling, as well as some of the tricks and tips that the professionals use.

Amiga Shopper – all you'll ever need to get serious with your Amiga.

On sale Tuesday 6 December. £2.95

Don't miss it!

I'VE SEEN THE FUTURE, AND IT WILL BE...

Gazing into the far future, we will be bringing you lots of lovely things, including supertests on modems, printers (colour and black and white), hand scanners, paint packages and many other wonderful things. Plus, we will continue to bring you the best in tutorials from people who really know what the Amiga is all about. Don't you dare go away!

A free watch worth £35.99* with every ABC colour printer bought before 30th November 1994.



THERE'S NEVER BEEN A BETTER TIME TO BUY AN ABC PRINTER.

Now is definitely the time to get your hands on the new, easy-to-use Citizen ABC Colour Printer. That's because we're giving away a "Life"† watch absolutely free with every one. But hurry! Time's running out. The offer ends on 30th November 1994.

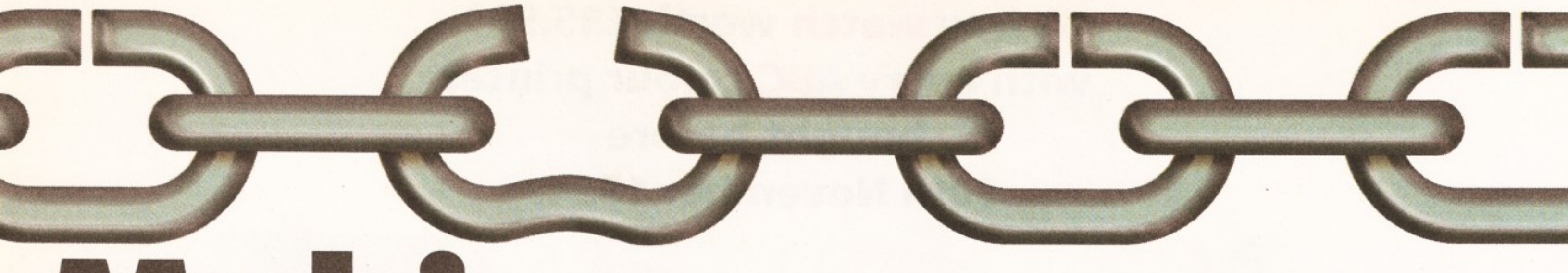
The ABC delivers outstanding colour graphics and crisp clear type. And with its EasyStart software setting it up is quick and easy. It's totally Amiga compatible and can handle virtually any paper including cut sheets, labels, multi-part stationery and envelopes. So now you can get a superb colour printer at an incredible price and still be left with time on your hands. Don't waste another second, buy a colour ABC and send off for your free watch today.

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The ABC is also available from Allders, Argos, Best Buys, Cargo Club, Centrex, Costco, Fona, John Lewis Partnership, Office World, PC World, Rumbelows, Silica, Tandy.

†Life by ADEC Watches and Citizen Printers are registered trademarks of The Citizen Watch Co of Japan. *RRP £35.99. Amiga is a trademark of Commodore Business Machines. Full written details of this promotion are available by sending an S.A.E. to Citizen ABC promotion, Citizen House, Waterside Drive, Langley Business Park, Langley Berks. SL3 6EZ.



Making a better link

Which Hard Disk interface could really get your machine going? Mark Smiddy examines the alternatives for all makes of Amiga.

Unlike many computers, the Amiga has always been able to function from floppy disks, but add a Hard Disk and you will revolutionise your Amiga overnight. Hard Disks used to be a luxury found on the larger systems; today though, they are becoming an essential part of a serious Amiga set-up. Early machines, like the B2000, were the first to be offered with a Hard Disk based on a card (like most PCs), but market demands eventually brought about the (in)famous A590 for the A500.

The original A590 came with either an XT-IDE or SCSI drive of a miserly 20Mb capacity and costing a staggering £400. These days, a 20 Mb drive wont get you very far, with programs such as Pagestream 3 taking an 11 Mb chunk out of your drive. In fact, most manufacturers have stopped producing drives smaller than 100 Mb, and most serious users wouldn't consider anything smaller than 150 Mb.

Recent machines, like the A600, A1200 and A4000, come with an AT-IDE interface on board capable of supporting one or two drives and it's this which has seen the virtual demise of the external drive so common on the A500 machines. At the time of writing only two external drives are available for the A600/1200, with most suppliers opting for an internal option, although this can be problematical. Space inside the machine is limited and although a 3.5" high drive can be crowbarred in, this process isn't recommended unless you are happy making serious modifications to the insides of your machine.

In this feature, we have decided not to look at the drives themselves, but at the interfaces which sit between your Amiga and the drive. This is an often forgotten link in the chain. After all, what's the point in having an incredibly fast hard drive if your interface is holding the whole thing up?

To make sure that all of the tests were fair, we have used (wherever possible) the same disk – a 1 Mb IBM SCSI -2 mechanism. This means that it's possible to do a direct comparison between he various interfaces to see which is fastest.

Industry fears over Commodore's fate has also seen the virtual disappearance of several well known cards (such as the DataFlyer 2000) and we have opted not to cover these since their availability is in doubt. However, we have discovered several unusual alternatives including a natty dual AT-IDE card from Alpha Data which supports an extra Hard Drive and an IDE CD-ROM.

HARD DRIVE DEVELOPMENT

Development of Hard Drives is something shrouded in mystery and perhaps the most confusing area for everyday users is the number of different interfaces and controllers. In order that this situation is not exacerbated, I will attempt to clear up the source of confusion

Once upon a time, [I love fairy tales – *Ed*] someone decided it would be a good idea if a standard interface were developed for hooking a Hard Disk to a small computer.

Various approaches were tried, including a development from the successful Shugart floppy drive interface. It's worth remembering that this was at a time when PCs were a pretty new idea and no one had really decided which processor was best. For example, Commodore were splodging around with the PET (Personal Electronic Transactor) and the giant IBM were experimenting with the original 8088-based, modular PC. The garage-based Apple were working with the Signetics 6502 while others preferred the Zilog Z80 which supported the CP/M operating system.

All these processors and systems had a single thing in common – an 8-bit data bus. (That means data is transferred from and to the CPU in little chunks of 8 binary digits at once.) This, and the enormous success of IBM's PC led to the arrival of the Integrated Drive Electronics or IDE interface. IDE was made possible, in part at least, by the incredible developments in microelectronics

JARGON BUSTING

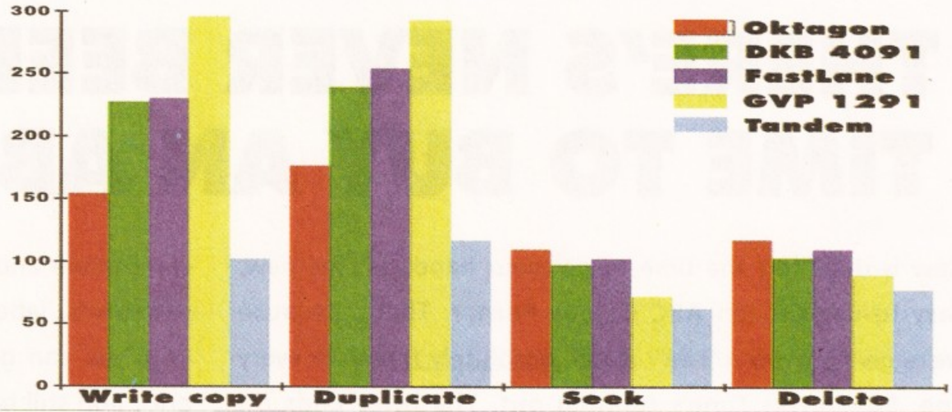
Bus – Generic name for a set of shared control signals, data and address lines. The main bus in an Amiga system is called the Zorro slots.

DMA – Direct Memory Access.

ISA – Industry Standard Architecture. Another name for the PC-AT bus.

RDB – Rigid Disk Block. A reserved area on Amiga hard disks where the formatter can store all sorts of information about the hard disk. Everyday users don't need to worry about this since most controllers support it anyway.

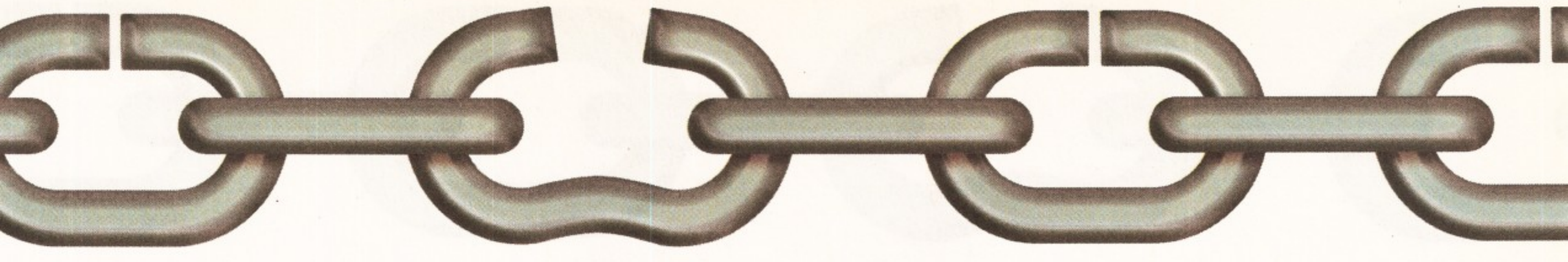
HOW THEY COMPARED



Test:	Octagon SCSI	DKB 4091	FastLane Z3	GVP 1291	Tandem	Unit
Load Large file	**2**	**1**	**1**	**1**	**3**	**Seconds**
Write copy	**154**	**227**	**230**	**295**	**102**	**Kb/Sec**
Duplicate	**176**	**239**	**254**	**293**	**117**	**Kb/Sec**
Seek	**109**	**97**	**102**	**71**	**62**	**Files/Sec**
Delete	**117**	**103**	**109**	**89**	**77**	**Files/Sec**

TEST CONDITIONS:

The same 1 Gig SCSI 2 drive was used for all of the tests; 1748 files 192 dirs copied using a total of 31Mb of store. 410Mb IDE source drive in A1200 and A4000. Tests averaged over three passes. No speed tests were carried out on the Oktagon AT card due to a hardware failure.



enabling designers to get a complete Hard Disk interface on to the drive chassis. This left the way open for a simple, 40-way connector to become the standard and very little interface logic was needed to interface the drive to the computer's data bus; all the work was done by the drive itself.

This original XT-IDE as it is now known was an 8-bit interface and was not regarded as a suitable option when CPU developments broke the price barrier for the 16-bit data bus found on CPUs such as the 80286 and 68000. Although the original IDE could be made to work, one practical way of increasing the speed (by a factor of more than two) was to increase the number of data lines to 16. This later version (called AT-IDE) was fitted to the first 16-bit PCs, sold as the AT series by IBM and ran on an 8MHz bus. (Curiously enough, an XT-IDE interface was fitted to the A590 as well as SCSI which explains in part some A590s performed better than others using SCSI.)

When commodore were designing the A600 and A1200, they opted for a built in IDE interface on the grounds that it is cheaper than the alternatives. However, this has the limitation that you can only connect one hard disk to your machine, and the IDE interface which they used is pretty damn slow. Some earlier models of Amiga (such as the A3000 and A3000T) had a SCSI controller built in instead.

AT-IDE was not perfect though. Although it was a lot faster than what it replaced, it only supported two Hard Drives – Master and Slave. This limitation was fine in the PC where everything is controlled by modular cards, but didn't leave much room for maneouver in other areas. While IDE was vying for acceptance, other developers were working on the Small Computer Systems Interface or SCSI. SCSI (pronounced "skuzzy") is not big on the PC, which explains why it was hidden for so long, but it was adopted by Apple for the Mac.

The idea behind SCSI is that the device does not have to be a Hard Disk. It could be a printer, a tape streamer or any one of a number of other types of peripheral. You can even get hold of SCSI scanners and floppy disk drives. SCSI can also be used to network machines together, although this has never been implemented on Amigas.

The most important difference between IDE and SCSI is the number of devices each controller can control. IDE is limited to two drives – typically either a CD-ROM and a Hard Disk or just two drives, but an entire system of seven devices can be hooked up over SCSI. My Macintosh has an Epson 6500 scanner; Syquest removable Hard Drive and SCSI laser printer attached to it, leaving room for a tape streamer and two other devices (the seventh address is occupied by the Mac).

The Amiga's SCSI implementation is similar to that on the Mac, but is only fitted as standard to the A3000 machines. SCSI is available in different guises for the other machines as a slot-in card or accelerator adaptor for the A1200. Perhaps the only problem with SCSI (if it is a problem) is different devices need special driver software. For example, the Amiga interface for the Epson scanner works on the serial port and no software is available for the printer. The Syquest does work though and this enables me to use different disks to back up data from the Mac and the Amiga.

GVP A1291 – A REAL BEAUTY

This is not a SCSI card in its own right, but an adaptor for the existing GVP A1230 accelerator for the A1200.See the Accelerator Supertest in our November issue for more details. Costing the thick end of £300 for the most basic configuration, this seems a little costly at first, but then consider you're also getting a 68030 running at 40MHz – faster than the A4000/30 and it starts to sound a much more attractive option.

Like everything made by GVP, this board is a real beauty and couldn't be easier to fit. All you have to do is pop out the blanking plate from the rear of the machine and slide it home – that's all there is to it.

Then connect an external SCSI drive using a standard 25-way D such as the one fitted to the A3000. GVP's latest software is even better than the earlier versions and makes life even easier, formatting with ease a particularly troublesome 1Gb drive we were using for the benchtests.

> ***"Like everything made by GVP, this board is a real beauty and couldn't be easier to fit."***

The most difficult part of setting this system up lay not with the A1291, but obtaining a suitable box for the Hard Drive, as you can't fit one inside the A1200. Power Computing supplied ours and currently offer two (prices on application).

The smaller, neater one houses a single half-height 3.5" drive and the larger version takes a 5.25" CD-ROM plus a second Hard Disk or removable. Both have internal power supplies external SCSI address configuration and pose no trouble whatsoever.

Two other similar cards are expected to arrive soon from DKB (for the Viper II) and Phase 5 Digital (for the Blizzards) and we'll look at them in due course. In the meantime this option is a great all-rounder.

Watch A4000/30 owners go green with envy when you show them an A1200 outperform their machines and drive a CD-ROM and SCSI Hard Drive into the bargain. For that kudos alone, this board comes highly recommended.

GVP SCSI Adaptor

Design & Construction: 90%
Like everything GVP make, it's wonderful – what did you expect?

Documentation: 70%
A little on the cheap side, but everything you need is there.

Software: 90%
FaaastPrep has always been one of best around and it still is.

Performance: 85%
It's difficult to imagine how it could be slow after being bolted on the back of a very fast accelerator!

Value: 90%
Like everything made by GVP, you get what you pay for and this is an essential extra for the A1230.

Overall Rating: 88%
Worth buying a GVP accelerator for – a superb option to take the A1200 into the next dimension.

OKTAGON 2008 SCSI/AT – BUDGET FLEXIBILITY

Alpha Data are unusual in offering the 2008 in two distinct versions, both retailing at the same price. One fitted with a high-speed SCSI 2 controller and the other with AT-IDE – like the A4000's native system. Both Oktagons come with sockets for 8Mb memory expansion in ZIP sockets, which, at the time of writing, cost about £21 per megabyte.

Perhaps the greatest advantage of these cards is that they work in every big-box Amiga from the A2000 machine right through to the A4000/40. The Zorro II interface is not affected by the current Fat Buster problems so anyone could buy one of these without worrying if it will work (or having to butcher their machine to find out).

On the down side, the SCSI 2 interface is strangled somewhat by the slower speed and reduced bus width of Zorro II, but you only get what you pay for and these cards are little more than pocket money when compared to the others.

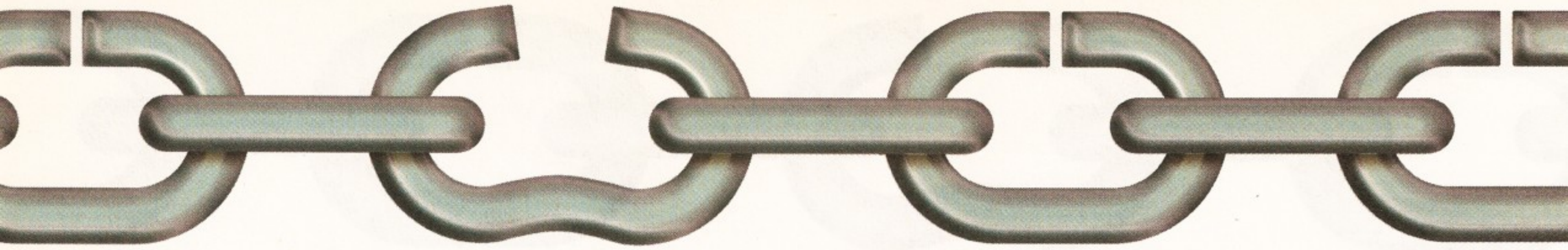
Design and construction is about what you'd expect from a budget card although I was a little wary about the use of a standard 25-way D SCSI 1 connector supplied with the SCSI version. Although this is standard fitting on the Mac and A3000 SCSI, it is not rated for the higher speeds usually associated with SCSI 2. As this card is not a full SCSI 2 one, this shouldn't pose a real problem.

> ***"You get what you pay for and these cards cost little more than pocket money when compared to others."***

Oktagon 2008-SCSI 2

Design & Construction: 72%
Better than its IDE brother, but still miles behind the rest.

Documentation: 30%
Less said about this the better.



Software: 40%
Works at a pinch – get someone to format the drive for you.

Performance: 65%
SCSI 2 is strangled by the Zorro II interface, but you aren't paying for speed.

Value: 82%
It's a SCSI 2 card and 8Mb RAM expansion and as such it's not too bad.

Overall Rating: 62%
Probably the best budget buy with more features than the 4091, provided you don't mind the lack of Zorro III speed.

OKTAGON ATBUS-2008 – GIVE IT A MISS

The AT version is somewhat less impressive and although priced exactly the same, is less complex and felt cheap. Where most boards extend across the full width of the Zorro slot, the AT-2008 only makes half the distance – the remainder being held tentatively on the drive mounting plate.

It doesn't look nice or feel particularly strong, and even though it will not be in and out of the machine, I felt this was one area where the design should have been better. Remember, this cavil does not apply to the SCSI 2 version – be careful not to confuse the two.

On balance, although these cards are not going to win any awards in the speed stakes they do score in the compatibility race. The IDE version is not something I'd want in my machine unless I happened to have an old IDE drive hanging around (from an A1200 for instance) but the SCSI version is, in complete contrast, a good choice.

Yes, it looks like a real budget job – yes, it isn't very fast, but for the money it makes a very real and cheap option to the 4091 if you blew all your savings on an A4000.

Oktagon ATbus-2008
Design & Construction: 40%
Looks and feels feeble, cheap and nasty.

Documentation: 30%
Should take a few pointers from the Phase 5 Digital crew.

Software: 40%
Dreadful! Find a friend with Commodore's HDToolbox.

Performance: n/a
Don't expect too much from that AT-bus on a Zorro II card.

Value: 50%
Way over the top for what amounts to the Tandem card with a backplate.

Overall Rating: 40%
Give this one a miss unless you really need to stick with AT-IDE.

TANDEM CD+IDE – LEAVES A LOT TO BE DESIRED

Cheap. Nasty. Horrid. There's three ways to sum up the Tandem. This board has been built down to a price rather than up to a specification, so much so that it doesn't even fit in the Zorro slot properly!

The little half-card goes in all right (once you've worked out which way to put it in) but there's no support bracket or Hard Disk mounting plate. At the very least I would have thought they could have stretched to something as basic as a fiver's worth of steel.

If that wasn't a big enough surprise this is the first board I have seen in years that doesn't come with an Autoconfig ROM and must be started by BindDrivers (the least used command on Workbench). The nasty feature with this is you have to copy the startup "expansion" software onto every boot disk if you want to use the device: a real pain if you only boot from floppy.

This card is probably only any use if your machine is already fitted with an IDE Hard Disk and you feel the need to add a CD-ROM and possibly another Hard Drive without the necessary expense of a SCSI card.

Like the Octogen cards which come from the same stable, the software and manual leave a lot to be desired, but at least this is budget kit you can run in an big-box Amiga without massacring your bank account.

Even so, this board does not have the RAM

> **"This board has been built down to a price rather than up to a specification."**

expansion of its larger brothers, so anyone seriously considering some soft expansion would be better advised to think long and hard about spending the extra on a proper SCSI card and a SCSI CD-ROM.

If it were half the price, then it would be reasonable value, but for this money I can't say I'll be sad to see it go.

Alpha Data Tandem
Design & Construction: 30%
Yuk.

Documentation: 30%
Urrrrgh.

Software: 40%
So it plays a CD and formats a disk – just!

Performance: 50%
It works.

Value: 45%
Cheap and nasty, but they're not asking the earth for it.

Overall Rating: 50%
Probably the cheapest way to add a CD-ROM and on that score it might just be worth the money, but I doubt it.

THE PROBLEM WITH BUSTER AND HIS DMA

If you are planning to stick a Zorro III card into your A4000, you may be in for a shock. Many of the early A4000s were fitted with a faulty version of the Buster chip. The problem lies with DMA. DMA (that's Direct Memory Access to you and I) is a process whereby a computer's custom hardware accesses memory while the CPU is doing other things, like calculations.

Fat Buster is responsible for handling this side of things from the Zorro III cards, and it has been revised several times. The latest we have seen was revision 11.

Revision 9 (which was fitted to most A3000s and early A4000s) had a fault on it which can produce a speed degradation of some 20 per cent. Many Zorro III cards will refuse to work at all with a Revision 9 Buster chip.

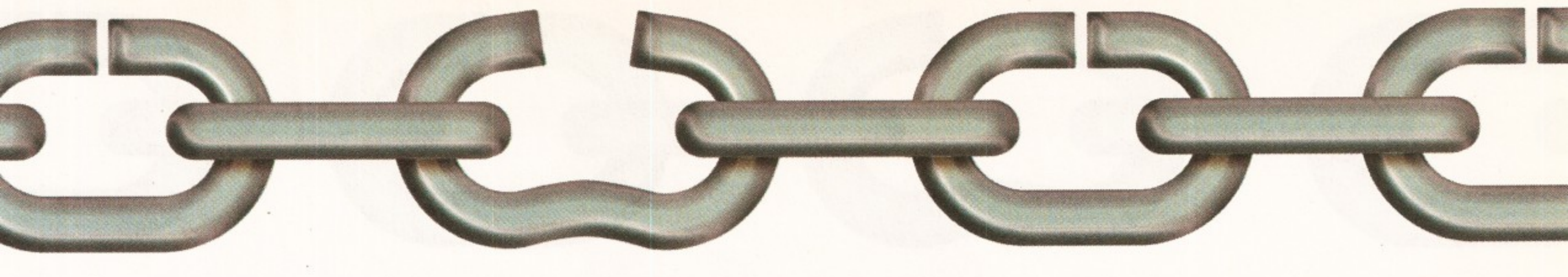
A program such as AIBB will tell you what revision of Buster you have, or you can open your machine and have a look. In the A4000, Buster is located near the Zorro daughterboard on the left. If your Buster has a -09 at the end of the numbers on the top, you will have problems with some Zorro III cards.

Unfortunately, the untimely demise of Commodore has meant that there is a worldwide shortage of Revision 11 Buster chips, and the situation does not look likely to improve in the near future. Some stores have stocks of this chip, so some phoning around would be well advised.

COMMODORE 4091 – AN "OFFICIAL" UPGRADE PATH

The 4091 is an A4000-only card (although it might work in a very recent A3000) because it is designed to work over the high-speed Zorro III bus architecture found in the more recent machines. Designed by Commodore, this board is licensed to and manufactured by DKB (the people behind the Viper accelerators) and is regarded by many as the standard SCSI card. (Remember that the A4000 comes with AT-IDE and not SCSI like the earlier A3000.) This also reveals one of the more interesting curiosities on this board too, namely that the external SCSI 2 connector is an unusual 50-way high-density D connector.

The A3000, GVP A1230 SCSI (and Macintosh for that matter) use a 25-way connector. DKB claim this choice was necessary for the higher speeds (up to 10M/Sec) involved with SCSI 2. The higher density 50-way cables use separate ground



> **"Construction is solid and the design feels good, with only a few little howlers."**

signals for each line, whereas the more usual 25-way cable uses a single shared ground.

The upshot of all this is that at high-speeds data can get mixed up on the wires and confuse the controller. This is all well and good, but the 50-way D connectors are not exactly standard parts – most use an Amphenol (Centronics) type which performs exactly the same function, so they're readily available and reasonably cheap (about £15 for a 2 metre run).

Installing the board is a simple matter of mounting the Hard Drive and dropping it into a slot. Some SCSI 2 devices also require a special type of "active" termination and this is supplied on a separate board which must be fitted to the SCSI cable in order for the 4091 to work correctly. (Active Termination is fitted as standard to the GVP A1230 SCSI and FastLane anyway and this seems like a bit of a botch.)

The 4091 does have the advantage of lower cost than, say, the FastLane. It's a pity that there is no provision for memory expansion, but this does keep the cost down. Cards such as the FastLane allow you to add some serious memory to your Amiga.

Construction is solid and the design feels good with a few little howlers that only stand out when compared to the amazing FastLane. You should also be aware that this card refused to work with a revision 9 Buster chip, so you should check yours before purchasing.

For A4000 owners on a budget, this board offers an "official" upgrade path but there are several cheaper (and, in my humble opinion, better) options.

DKB 4091

Design & Construction: 85%
Looks and feels built to last.

Documentation: 70%
Like the GVP, this is a bit cheap, but you'll only need it occasionally.

Software: n/a
Missing!

Performance: 85%
More or less what you'd expect from a SCSI 2 card in a Zorro III card and a fast machine but…

Value: 70%
…you pay through the nose for it. Compare the figures with those for the FastLane.

Overall Rating: 82%
A good, solid card, but check your Buster before purchasing!.

FASTLANE Z3 – A MARVEL OF ENGINEERING

With an opening statement like: "FastLane is the most impressive of all the cards here", you might wonder why you should read any further? FastLane is, without doubt, a marvel of engineering.

Created by Phase 5 Digital, it comes from the same stable as the excellent Blizzard accelerator boards, but "Z3" in name is something of a giveaway. If you don't have a very recent A3000 or an A4000, then you're going to have to gaze in wonder – drooling like one of Pavlov's dogs is considered bad form in the Amiga community.

FastLane is a premier Hard Disk controller/RAM expansion designed exclusively for the power Amigas. This Zorro III beauty can be fitted with up to 128Mb of Fast RAM and sports a very fast SCSI 2 interface. If you've ever dreamed of owning a Porche, this is surely the alternative in computer technology. As is typical with German design, everything has been thought of and

THE MARK OF ZORRO (AND HIS SLOTS)

One of the features that made the IBM PC so bug-ugly and incredibly popular was its modularity. The basic CPU board contained precious little more than the CPU and basic BIOS. Everything else – memory, display driver, printer interface etc. was fitted to cards which slotted into special expansion cards. It isn't clear why IBM opted for this design, but whatever the reason it has made the machine very adaptable.

The expansion slots are little more than edge connectors which access all the various control lines, address and data buses. The PC was little more than a kit, but this accident of design has been adopted in one form or another by just about every major manufacturer on their larger systems. Several standards exist on the PC: 8-bit from the XT machine; 16-bit from the AT. Both of which run at 8MHz regardless of how fast the processor is and the more recent Vesa and PCI standards which run at the processor speed.

The Amiga's bus has always run at the system speed of 7.14MHz up until quite recently but proper expansion slots did not appear until the B2000. This standard became known, for no readily apparent reason, as Zorro II (Zorro I was the sideways bus on the A1000). Zorro II accepts special Amiga peripherals just like the PC and leaves space at the rear of the machine for any external connectors. Nevertheless, because the machine is based around a minimum 16-bit processor, the Zorro slots also have a 16-bit data bus.

THE A3000 PROBLEM

The A3000 caused a problem. This was the first Amiga to be fitted with a native 32-bit processor, and Zorro II didn't have enough lines to support it. IBM got around the problem when developing the PC-AT by adding an extra "AT" card slot – in other words, they moved the goal posts. Commodore could have done the same thing with the A3000, but that would have been even more problematical because they would have had to add another 16 data lines, never mind the greatly enhanced address space (32-bit as opposed to 24-bit).

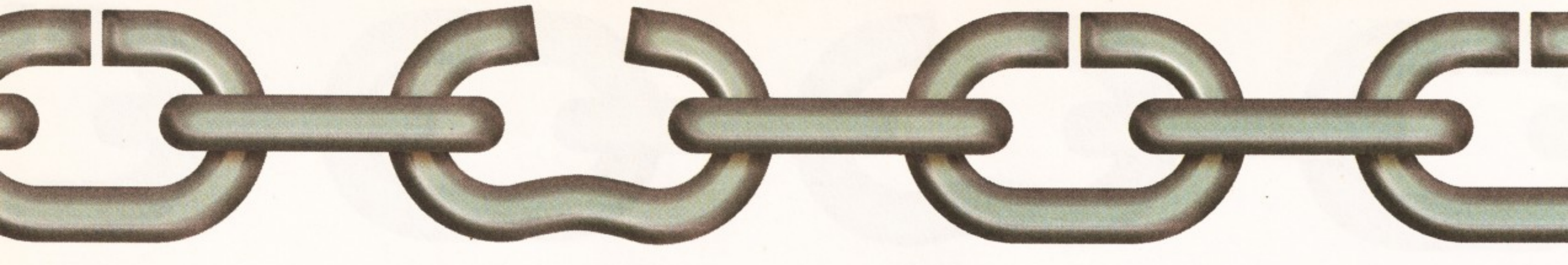
Rather than taking that potentially unpopular step, the designers opted for a more involved system where the data and address lines are shared if a Zorro III card is fitted. This means that a Zorro II card intended for an B2000 will work fine in a Zorro III slot (not the other way around though). Unlike Zorro II which has a straightforward address and data access, Zorro III shares some of the data lines with the address lines over two distinct Data and Address phases. It also works at the system speed and runs independently of the master CPU clock.

FAT BUSTER

Just to aggravate matters still further, the Zorro III bus is controlled by a custom chip called Fat Buster. This handles all the special control signals and is available in several different versions; at least 11 revisions have been produced to date. Later versions add some special features (quick bus arbitration, multiple transfer cycles and quick interrupts) to increase the effective bus speed even further. The latest Zorro III cards rely on these features and will not work in the earlier versions. The FastLane Z3 and DKB 4091 are typical examples which will only work in an A4000 fitted with the correct version of Fat Buster.

In theory it should be possible to change the Buster in an A3000 to make it compatible but there is more to it than just that. The FastLane Z3 requires a modification to the Zorro bus's control logic; on V3.0 A4000 boards too. Early A4000s were fitted with a three-state inverting octal bus driver (the 74LS240) while later machines came with the non-inverting version of the chip (74LS244).

By quirk of fate the '240 is not available in surface mounting version (the '244 is) so it was placed in a socket instead. This makes it a simple matter to change the chip and make a 3.0 board roughly compatible with 3.1. These devices are not expensive, costing less than a pound in one-offs and are available from larger suppliers such as Maplin Electronics.



SCSI 2 – THE FUTURE OF HARD DISKS?

A more recent Hard Drive development is SCSI 2. For most purposes, SCSI 2 is the same as SCSI and uses the same 50 way internal IDC connector. Oddly enough, SCSI 2 still only uses eight data lines, but the maximum synchronous data transfer rate has been increased to up to 10Mb per second. Externally, SCSI 1 and 2 use a 25-way D connector from the computer to the first peripheral and a 50-way Amphenol (like a Centronics parallel) plug between devices.

You can think of SCSI as working just like the card slots in the big-box Amigas, so how well does it multi-task? SCSI devices all share the same set of data and control lines, so only one device can be on the bus at any one time. In theory this means you can't access the hard drive at the same time as the printer, scanner or whatever, but in practice this never happens.

Driver software and clever hardware ensures that never more than one device has control of the bus at any one time. If this did happen, then, for instance, the data coming from a scanner would corrupt data being sent to a Hard Disk on the same bus. SCSI devices share the bus using a process called arbitration which is beyond the scope of this article. For more information see David Ward's feature in Amiga Shopper Issue 1, May 1991.

nothing left to chance. For example, fitting the board would be tricky due to the 50-way Centronics socket mounted aft: if someone hadn't had the foresight to lop a small piece off the PCB – thus allowing the board to swing neatly home into its mounting.

> **"Try as I might, I could not fault this board on design, performance or manufacture."**

Gazing at the 16 SIMM sockets, 21 custom and numerous other discrete logic chips is enough to give you a warm feeling about spending all that loot. This is one board that truly looks like it was built to perform. It almost seems a shame, that once locked inside the case it will be hidden.

HARDER THAN MOST

There's something very unusual about the Z3 that doesn't become immediately apparent until you try to fit a Hard Drive; there isn't room for one.

Although the board has a 50-way IDC jumper ready for the standard SCSI cable, the space usually reserved for the HDD mounting is completely occupied by a mass of RAM expansion (it was painfully empty on our review example). The drive will, therefore, normally fit either in the remaining drive bay (right of the floppy) or live in an external SCSI box.

The board will accept any standard 8 or 9-bit SIMMs without complaint and can take any speed from 100nS through to 40nS. In fact, even the fastest Amiga's cannot drive the 40nS chips at full speed, but Phase 5 claim with the board configured to 60nS and stuffed with good-quality 70nS memory, the expansion should function at up to 95 per cent that of the main board (the other five per cent or so is lost over the bus).

So how much memory can it take? 256Mb – a quarter of a gigabyte – ponder that for a moment, then consider you wouldn't see much change out of £10,000 for it. On a more realistic level, the FastLane does allow a mix and match of memory (within reason) with 1Mb or 4Mb SIMMs split over four separate banks so a typical configuration might have 8 or 16Mb.

HARD DISK

There isn't really much to be said about the Hard Disk side of this board, except to mention that it offers active termination for SCSI 2 Fast devices. Interestingly though, several configuration jumpers allow a variety of different configurations not available on the 4091.

For instance, FastLane can be set up to look for or ignore synchronous (high-speed) transfer protocols in the disks RDB or configured to work with older Hard Drives which have a much slower reset cycle. It's features like this that make it shine above the others.

So what's the bad news? The FastLane has come in for a certain amount of stick from some quarters due to the necessary modification of the A4000 motherboard, although this only affects Version 3.0 machines, fitting the chip is a little fiddly, necessitating removal of the CPU board; at best a tenuous task, and thankfully one that only has to be done once. Shaky translation from the native German leads the casual reader into thinking this chip is some all-important clock/timing generator.

As a quick glance at a Maplin catalogue will prove, this little beetle is nothing more awe-inspiring than an octal-buffer. This particular chip costs less than 30p in quantity and similar ones are found in every computer system under the sun. The replacement chip simply changes a logic level on the Zorro bus, and although this could have been done on the card, it was probably more cost effective to let the user do it.

Try as I might, I could not fault this board on design, performance or manufacture. It performs two of the most important expansion tasks faced for any small computer system, RAM and Hard Disk; and comes through with flying colours on both.

My only reservation would be the distinct lack of SCSI II peripherals, or at least, the driver software to connect them, but that caveat would apply to any SCSI board. The 4091 is alright, but on balance this board is streets ahead and I wouldn't hesitate to spend my hard-earned on it. (Assuming someone asks me to return this one!)

FastLane Z3
Design & Construction: 95%
If I rave over this any more I'll have to marry it.

Documentation: 80%
At last a manual that makes some sense and serves the more technically-minded, as well as beginners. The typesetting could be better though.

Software: 85%
Along similar lines to HD-Toolbox – but with Workbench 2 look.

Performance: 90%
It's fast, yes.

Value: 92%
The catch? What catch? It gives you a lot more than Commodore's own drive for the same price.

Overall Rating: 91%
Given the choice between this and the 4091, this is the one I would opt for. AS

WHERE YOU CAN FIND THEM

Oktagon 2008-SCSI
Price: £129
From: Power Computing,
44a Stanley Street,
Bedford, MK41 7RW
☎ 0234 273 000

Oktagon ATbus-2008
Price: £129
From: Power Computing,
44a Stanley Street,
Bedford, MK41 7RW
☎ 0234 273 000

Tandem CD+IDE
Price: £69
From: Golden Image UK Ltd,
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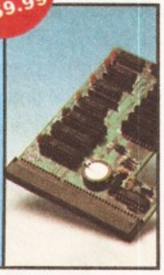
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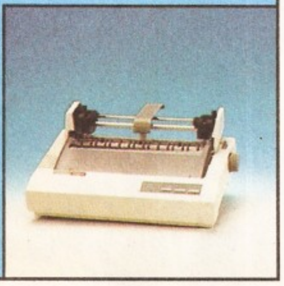
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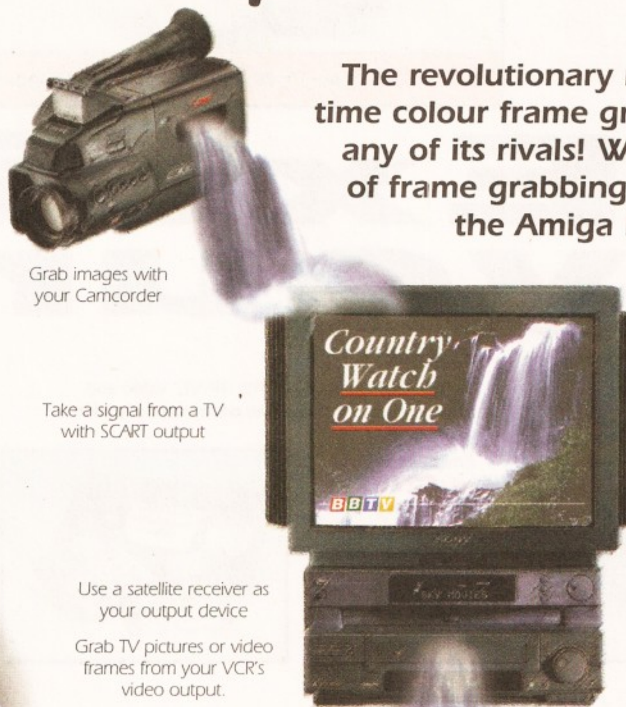
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Images in an Instant

Creating animations is hard work – Graeme Sandiford has found the answer for the lazy.

As we all know, the Amiga can be used to create some extremely impressive images. However, combining several images into an animation and adjusting these frames can sometimes prove far from easy. Adding and synchronising sounds and music can often be an even more complicated task. AWorks 2 has been designed by Axiom Software to help you add sounds and process animations as easily as possible.

Aside from making your life easier AWorks has something else to offer – Arexx support. The program uses Arexx extensively to communicate with image processors. It comes with several scripts and tools to enable it to work with both ADPro and ImageFX.

AWorks 2 requires Workbench 2+ and it is recommended that you have 2Mb of Chip RAM. As well as improved Arexx support, version 2 makes use of the AGA-chipset and anim7 and 8 formats.

As with several of their other products, Axiom have opted for a button-bank interface. Quite simply, the interface consists of banks, or rows, of buttons that when clicked either perform a function or bring up a requester. This type of interface has its drawbacks as well as its advantages. One of these drawbacks is that the screen can appear cluttered and therefore a little confusing. This is especially the case when you first start using the program. However, once you've been using the package for a little while you soon find the interface quick and easy to use. Most of the functions also have keyboard shortcuts.

The interface is actually split into 6 main sections. These sections are: the animation panel, text display area, tools section, image processors section, options section, and the file list.

The animation panel contains the buttons for loading, saving, clearing and playing animations. This is the area where you load in compiled animations rather than single frames. Once an animation has been loaded into memory, it can be viewed by clicking on the play animation button. This will display the animation at full size. If you press return while the animation is being shown, an animation control panel will pop up at the bottom of the screen.

STAYING IN CONTROL

The control panel has several counters and buttons for keeping track of and controlling the playback of the animation. Depending on the current state of the animation, some of the animation control panels' buttons will be inactive. For example, you cannot skip to the beginning or end of an animation while it's playing.

The top-left corner of the panel has a five-digit counter. This indicates the current frame on screen. Next to that you'll find the frame indicator which will tell you how fast the animation is being replayed. To the right of these two you'll find the ping pong and sound buttons. The sound button will toggle between an indication of whether the sound is on or off. The ping pong button will play an animation forwards, then backwards.

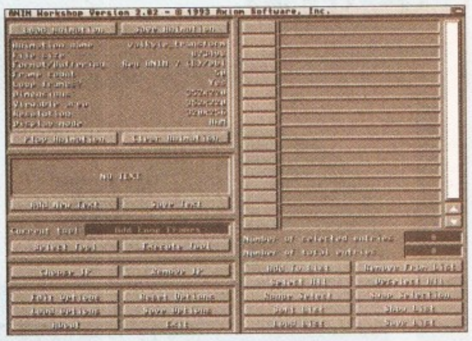
Underneath these buttons and counters are the main play-back buttons. These resemble an Audio CD player's controls; you can fast forward or rewind, skip to the end or beginning of an animation, pause and play forwards or backwards.

The middle of the screen is occupied by the frame marking tools. These can be used to mark the currently selected frames with information that can be used by AWorks Tools. To the left of these tools you'll find timing control tools and the frame info button. The timing controls have two modes of operation global and frame. The frame info button provides plenty of useful information about the frame's timing, sound channels and delta compression level. This is also the place where you can add sounds.

THE RIGHT TOOLS

Returning to the main screen, one of the most used parts of the program is the Tools section. This is the place where you can perform all sorts of operations.

Create (list) is probably the most used tool. It can be used to create an animation from the files that are listed. There is another variation of this, Create (wait) that will wait for individual files to appear in a specified directory and then compile them into an animation.



This is Anim Workshop's main interface.



The animation control panel can be used to control play-back and add sounds.



Most of Anim Workshop's most powerful features require ImageFX or ADPro.

Another very useful tool is ADPro (list/anim) and the ImageFX version. These can be used to create an animation from either a list of files or animation. In between selecting the files or animation and saving the resulting animation, a Arexx script will be applied to each frame.

Overlay is a clever tool that will take the current animation and overlay it, frame by frame, with another. The tool has several options such as the amount of mixing between the two animations and a transparency colour. This is great for combining anims generated in different programs.

Other tools supplied with AWorks2 include a animation splitter, a time squeezer or stretcher, a screen grabber and an Arexx tool that can apply an Arexx script to a series of images. AWork2's tools are really its strong point – they are powerful and flexible and, if you know your Arexx commands, you can always add to them.

The remaining functions are mainly for setting the program's options, choosing an image processor, selecting files from a list and adding text. The program is undoubtedly a powerful one that has been aimed at the professional and keen amateur market.

As such, the price is a little expensive at £99, especially if you don't have ImageFX or ADPro already. But, it does have some very powerful and unique features. It is also very easy to use and extremely flexible. In short, it is an excellent animation tool, but it's only for people who take their animating seriously. AS

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Anim Workshop 2
WHO
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WHERE
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CHECKOUT
ANIM WORKSHOP 2

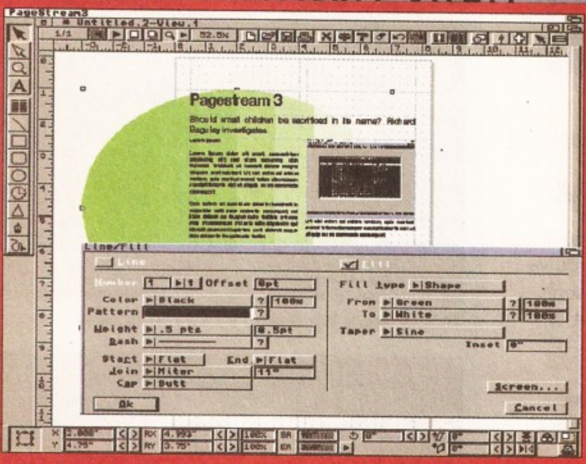
Documentation **80%**
Above average, but not spectacularly so. There are plenty of diagrams through out and clear instructions.

Features **87%**
This program is loaded with powerful and versatile features. The only drawback is that some of them must be used in conjunction with ADPro or ImageFX.

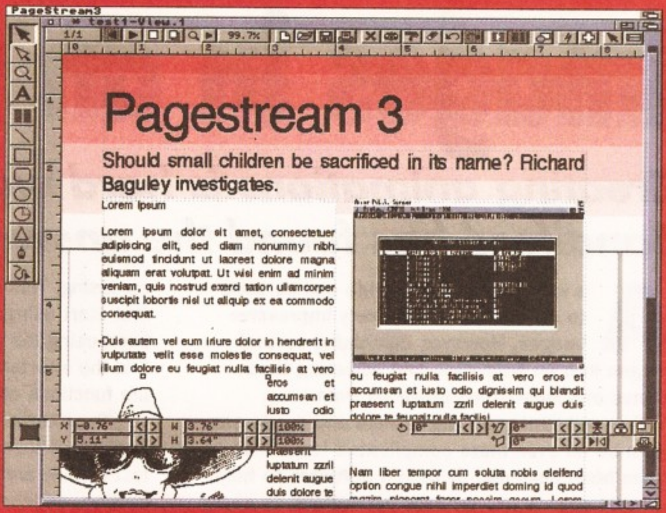
Ease of Use **92%**
Axiom's button-bank may not be a terribly exciting interface, but it does put everything within easy reach and in a logical position.

Value **87%**
The package is a tad expensive, but it is aimed at the more serious animators.

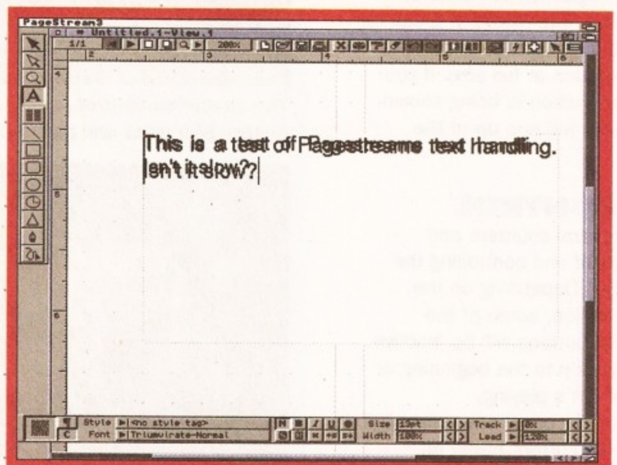
Overall **87%**
An expensive, but very powerful and versatile animation tool that will make many animators' lives a lot easier.



Gradient fills and the like are well supported, along with a selection of fill patterns. You can also define your own.



Bad headlines, nonsensical text and gratuitous use of dodgy clip art. Isn't that what DTP is all about?



Text handling shows occasional quirks, such as not erasing the old text when you increase the point size.



Also included in the package is BME, a pretty basic, but quite usable, bitmap graphic editor.

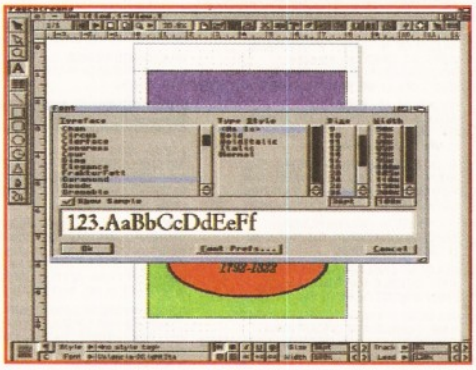
All DTPed up and nowhere to go?

Richard Baguley takes a first look at the most eagerly awaited program since the Magic Roundabout – Pagestream 3.

Over the past few months, two programs have been exciting the Amiga user. The first of these was the stand-alone version of LightWave, and this was finally released a few months back. The second was Pagestream 3, now available to the impatiently waiting Amiga community at long last.

Amiga users have been drooling over specification sheets and pondering on Soft Logik's claim that this new version of their excellent desktop publishing program would beat any DTP program on any machine. When I was at the World of Commodore show in Pasadena in October 1993 Soft Logik were showing off what looked like a nearly finished version of the program and promised a release within the next few months.

In fact, some Future Publishing magazines have received letters asking them why they haven't stopped using QuarkXpress and started using Pagestream yet! Just under a year later, you can actually go out and buy Pagestream 3. So how does it shape up?



Pagestream 3 comes bundled with 56 fonts, and it can use Postscript type 1, Compugraphic and Soft-Logik fonts.

Firstly, I should point out that this isn't a review. For the reasons behind this, see the box headed "So where's the promised review?". This is really a first look to give you, our beloved readers, an idea of what the program is like and what sort of functions it has. A full review will follow in a few months time. In the meantime, let's take a quick look and see where the program stands

The first thing you are going to need to use Pagestream 3 is a Hard Disk, as it can't be run from floppy disk. You'll need a pretty big Hard Disk as well, as the full installation of the program takes a whopping 11Mb of disk space. Getting rid of the clip art and other stuff can chop this down to 3.4Mb, though. You'll also need at least 3Mb of RAM and Workbench 2.04 or higher.

Once you start dropping graphics on to your pages or using large text, you are going to need a hell of a lot more memory than 3Mb, so as with most programs of this type it's a question of "the more, the merrier".

SLOW TRAIN COMING

Once you get the program on to your machine, you can get on with the serious business of DTPing. Or at least that's the idea. This version of Pagestream makes this somewhat difficult, as it is incredibly slow. It's just about usable on an A4000 fitted with a 40Mhz 68040 accelerator, but it's by no means fast.

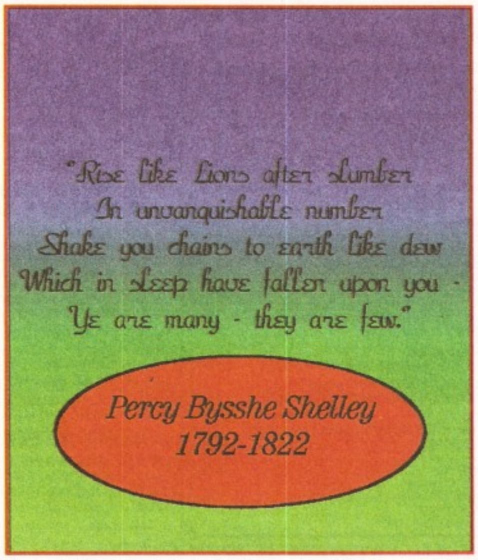
Put it on a slower machine and you are talking serious slowness. For example, the program can't even keep up with text as it's typed in on the accelerated A4000. No wonder that the instructions recommend that you type all of your text into a separate text editor or word processor.

Speaking of text brings us on to another area of the program. Pagestream imports text and graphics through a series of filters, which can be easily added to the program. As shipped, it comes with text filters for the most common Amiga word processors and a few PC ones (such as WordPerfect and MS Word). It can also import a wide range of graphics from programs such as Adobe Illustrator, Freehand and Professional Draw.

It can also cope with bitmap file formats, such as TIFF, GIF PCX and EPS, although the latter is notorious for being something of an, erm, loose standard.

Apart from the slowness, Pagestream is extremely easy to use. The programmers have obviously looked at programs on other platforms such as QuarkXpress and Pagemaker and taken some of the good ideas to incorporate them into Pagestream. There are some nice touches, such as the inclusion of a wide range of macros (although some of these have not been finished in this version).

One of the big selling points of this new version has been its ability to import Professional Page documents, but this should be taken with a large pinch of salt. The documentation warns that "because the Professional Page file format is not publicly available and had to be determined through trial and error, it is possible that there are some Professional Page options which are not correctly converted".



Pagestream is just as happy printing to an IFF file as to a colour laser printer, as the above example clearly shows.

SAVE YOURSELF!

However, bugs are still abound. The text handling is still somewhat problematic (see the grab opposite for the sort of thing I mean), and there is a serious bug in the saving routine which means that the program crashes every time you try and save to an existing file.

This really isn't acceptable for a program costing over £250, finished or not. Although this isn't a review, I bet that all you lot will be reading this last paragraph to see whether Pagestream 3 is actually worth investing your £250 in.

At the moment, I regrettably have to say no. It's extremely slow and seriously buggy. Several very important features are still missing and the program is not really usable. However, there is the *potential* for an excellent DTP program there, and I look forward to working with a finished version. AS

SO WHERE'S THE PROMISED REVIEW?

Last month we promised you a review of Pagestream 3. Unfortunately, since then a few more facts about this long-awaited program have come to light. Although the program has now been released, it is still not finished. Various major functions of the program are still missing (see the box headed "Still to come..."), and there are still some very serious bugs.

In the light of this, we have decided not to review the program at this point. There are two reasons for this: we don't review unfinished software *and* we believe that it would be unfair to review the program in its present state. At the moment, Soft Logik are at work fixing the bugs and adding the missing features, so by the time you read this review, many of the problems with the program may have been fixed.

We have to write reviews of the version of the program we have, not what the programmers are promising in a couple of months' time. In its present state, Pagestream 3 would get a very low mark. However, we will be doing a full and comprehensive review in a few months' time, when the program is finished.

So why have Soft Logik decided to release the program in this state? "In a perfect world, we would not have released Pagestream 3.0 until everything was done", says the readme file that comes with the program. "However, you, our users, have put a tremendous amount of pressure on us to release Pagestream 3. We though it was better to give it to you now so that you can start using the many great features that are finished."

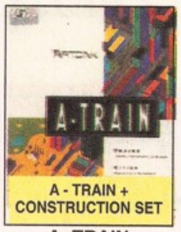
STILL TO COME...

The version of Pagestream which we looked at for this article (3.0) had the following features not yet completed: append, save as template, find/replace, spell check, external articles and graphics, send to editor for text, information, facing pages, greeking, heavier/lighter, some paragraph format options, hyphenation, conditional break, text codes, fencing, applied bold and italics, trapping, anchored graphics, auto back-up, typographic preferences, kern pair editing and pen and reshape tools.

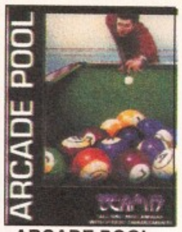
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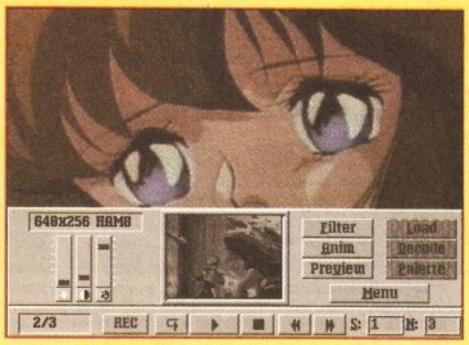
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Here's ProGRAB's control panel. The grey area in the centre is the preview screen.



"Oohh, that so and so is a real bitch!" Yes, you too can capture your favourite soap stars.

The Roar of a Lion

Graeme Sandiford takes a look at ProGRAB 24RT, a low-cost Real Time digitiser that could grab the lion's share of the market.

Video digitisers have certainly come a long way in the last couple of years and the ProGRAB 24RT is the latest addition. I remember the good old days when you would spend hours hunched over your computer and a VCR fiddling with the contrast and brightness controls. If you were lucky, you would be rewarded with a smudgy, low-res monochrome picture that looked vaguely like the image you were trying to capture.

The ProGRAB 24RT is 24-bit video digitiser that can be used grab colour images from a video source. This video source can include any VCR, camcorder or TV signal that has been passed though a VCR, as long as it has a composite or SCART output. It's a real-time digitiser so you don't have to have a perfect-still frame video to capture colour images – the digitiser can capture colour images as the video is running. As well as serving this function the digitiser hardware also doubles as a teletext decoder.

The ProGRAB 24RT fully supports the AGA-chipset and makes us of its 24-bit palette and new resolutions. The grabber can digitise video signals at a resolution of up to 1472 by 512 pixels in Super hi-res mode with maximum overscan. The images can be captured and displayed in HAM8, however the HAM8 palette can only be utilised at a maximum resolution of hi-res laced. The product can be used with any model of the Amiga as long as you are running 2.04 or later and have at least 1.5Mb of free memory. Of course, the more memory you have the greater use you'll be able to put the digitiser to. Extra memory is definitely recommended if you are planning to capture a series of frames for an animation.



This grab is full of rich colours, which is especially good as the TV image was very dark.

THE SURPRISING SPECS

I was pleasantly surprised when I first saw the ProGRAB 24RT, as I expected it to fit on to the back of the Amiga. Although, it does connect to the Amiga's parallel port, located at the rear, it is actually a self-contained unit that measures about 15x12x4cm and is of an excellent build-quality (don't tell anyone at Harwoods – but, I dropped and it still works). It has its own lead running from the parallel port to the unit. This is great, as you don't have to clear up more desk space behind your machine. As the connecting lead is almost 2m, you don't have to even place the unit on the same desk. The unit also has its own power supply that plugs into the unit's rear.



Although this image is a lot brighter, the ProGRAB has not "bleached out" the details.

Also located at the back of the unit, is the RCA (phono) socket that will accept the video signal. A nice feature that also surprised me was a little green light that turns on when the unit is receiving a composite signal. This can save a bit of effort if you are having trouble capturing an image. If you can see that a signal is being received by the digitiser, then you can concentrate your problem-solving on the software set-up and the connecting lead.

THE SNAZZY SOFTWARE

Installing the software is a piece of cake as the ProGRAB uses the Commodore Installer utility. You need only tell it where you what ProGRAB 24RT to be installed and which processor and co-processor you are using and it will do the rest.

On running the program you will be greeted by the main menu screen, which consists of several buttons. From here you can enter the animation mode, the control panel, set the screen mode and display the image in the current buffer. You can also load files or save the current image as an ILBM. Although the version of the software I managed to look at was unable to save in other file formats, the final version, which will be in distribution as you are reading this, will be able to save files as JPEGs as well. You can also save your animations as anim5 files for replaying in other applications or for inclusion in a project.

All of the usual PAL screen modes are available from the screen mode menu. The number of colours in the palette can range from 16 up to 262,144 if you are using an AGA-machine. You can also choose from several overscan resolutions.

The control panel is quite simple and only has three sliders and a few buttons on screen. In the centre of the control panel you'll find the preview window. This is a small window, about one-third of the size of the panel, that displays a monochrome



The ProGRAB is equally good at capturing the bold primary colours found in animations. This grab has been taken from Dangaioh.

image of the video picture that is being received by the unit. Three sliders on the left of the screen are for altering the image's contrast, brightness and saturation. Also found on the control panel are several filters, which although not to spectacular, they are quite effective. The majority of the filters are for sharpening and blurring images.

The animation menu is where you set your preferences for grabbing an image and where you'll grab one or a sequence of images. You can either digitise in colour or mono. You can also add a delay after starting to grab a screen and, if you are grabbing more than one screen, between each frame. The number of frames you can grab is limited by your machine's available memory. You can also enter an interleave value and select double buffering.

Grabbing an image is quite straight-forward. Once you've set your options you will be taken to the control panel. At the bottom of the control panel you will find a strip of buttons, this is the animation control panel. The animation control panel looks and operates a lot like a VCR or CD player. To grab a frame all you have to do is press the record button. You can then play the frames in sequence or flip from one to he other.

However, the image you'll end up with will appear to be greyscale. One of the reasons that the ProGRAB is so cheap is that it has no hardware decoder. Instead, to decode the image to a colour one you must use the software, simply by clicking on the decode button. The computer will then set about decoding the colour information. Unfortunately, this process can take some time to complete, it can take a good couple of minutes to decode two hi-res images. However, personally I'd rather wait an extra couple of minutes than pay an extra £100.

As well as a top-notch digitiser the ProGRAB 24RT is also a teletext decoder. However, the current software can only decode satellite TV teletext. Within the next month or so it will be updated to work with terrestrial TV. The software uses the digitising hardware to download the teletext information, so you will need connect the TV aerial to video and transfer the signal as composite output. If you are going to be using it with satellite TV then it is easier, as most satellite decoder are equipped with composite or SCART output, so you can connect it directly to the digitiser.

Once the hardware has been set up you can get the software running. The teletext program is very simple, you have a screen where the text will by displayed and a single pull-down menu. This menu is used to start the program downloading the teletext pages. Once initiated, the program will search through the incoming signal for teletext information.

On finding it, the program will download all of the pages into your computer's memory. Unfortunately, this can take quite a long time – I waited over an hour to load in some MTV pages and had to abort before all of the pages had been downloaded. Once loaded, you can move through the pages using the cursor keys or by typing a page's number. This all seems a bit of waste of time, particularly as most modern TVs have teletext built in – although, it is a nice bonus.

FEEL THE QUALITY

Regardless of all the trimmings and fancy features that a digitiser might sport, the most important thing is the quality of the images it produces. It must be said that I was once again pleasantly surprised by this digitiser. After only a few moments spent adjusting the software's controls, I was able to get some impressive results.

The images produced where clear and sharp, they also made good use of the HAM-8 colour mode to make sure the images where smooth – with little aliasing. With such high-quality grabs and ease-of-use, this has got to be one of the best non-professional digitisers around. With a price of under £130 it certainly provides the most value for money of any digitiser around at the moment and gives the chaps and chapesses at Rombo, who've had a firm hold on the budget digitiser market, something to be concerned about. AS

WIN A COPY OF PROGRAB 24RT

You've read the review and seen the Amiga Shopper Best-Buy stamp of excellence – now you want to get your hands on a copy of this excellent video digitiser as quickly as possible.

Well, you could be one of the lucky five readers who'll win a copy of ProGRAB, worth £129 each, from Gordon Harwood Computers. Turn to page 98 for details on how to enter this fantastic competition.

Don't miss it!

WHAT
ProGRAB 24RT – £129
WHO
Gordon Harwood Computers
WHERE
Gordon Harwood Computers
New Street,
Derbyshire DE55 7BP
☎ 0773 836781
Fax: 0773 831 040

CHECKOUT PROGRAB 24RT

Ease of use **95%**
The simple interface is extremely easy to use – if you can use a VCR you can use this.

Features **89%**
The ProGRAB may not be as feature-laden as the Rombo's Vidi24RT, but it has enough for most tasks.

Quality **94%**
This product is capable of grabbing images with a spooky degree of realism.

Price **96%**
A 24-bit colour Real Time digitiser for £129 may seem unbelievable, but it's true.

Overall 94%
If you want to capture realistic images, without spending a fortune, this is the tool for the job.

AMIGA SHOPPER BEST BUY



The ProGRAB hardware can also double as a Teletext decoder, although not a very fast one.

"With such high-quality grabs and ease-of-use, this is one of the best non-professional digitisers around."


"I don't know, we didn't 'ave no fancy digitisers in ma day, just a box 'o crayons and..."


This is a tricky image to capture, as it contains reflective and dull surfaces.


AMIGA
FORMAT


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Time to change your sheets?

There's a gap in the Amiga market for a professional spreadsheet. Graeme Sandiford finds out if TurboCalc V2.0 can fill it.

One of the areas that Amiga software developers have fallen behind their PC counterparts is the creation of powerful spreadsheets. This lack is a real shame, as the Amiga is more than capable of handling such tasks. Although not the most exciting of the Amiga's abilities, it would help the Amiga gain some credibility as a business machine. The latest version of TurboCalc might just fit the bill.

In order to compete with the likes of Excel and Professional Calc a serious spreadsheet got to have plenty of powerful features and a high degree of user-friendliness. TurboCalc has been designed to be easily used by beginners, with enough features to meet the needs of power-users. At £59 it's near the limit of most casual spreadsheet-users' budgets, but well within a small company's.

Although, there isn't much scope for distinctive looks when designing a spreadsheet, TurboCalc's interface is attractive and yet functional. Most of the program's functions are accessible from both a pull-down menu system and from a button bank.

This approach has proved popular on most platforms as it provides for the need for quick access to tools of an experienced user and the need for guidance that most beginners have. When you begin using the program you'll probably use the menu system – after a while you'll get used to the different buttons and the functions they perform.

> *"This package certainly delivers in terms of power."*

Another beginner's aide the program has is on-line help for virtually all the program's functions. To use the help facility you have to pull-down the help menu until you get to the entry for the menu that you need help with. So if you wanted help on exporting or importing data you would go down the help menu until you get Project menu entry.

As well as explaining the various menu items the help system can also provide you with a list of keyboard short-cuts. Speaking of keyboard short-cuts, the box contains a cardboard keyboard overlay that can be placed over your function keys.

WHAT CAN IT DO?

So what features does TurboCalc have? TurboCalc has all the usual features you would expect from a spreadsheet, such as being able to input formulas as well as text and numbers. It also has its own macro system, ARexx support, database and a choice of graph types. However, the most unusual feature the program has is the level of control you have over the way the spreadsheet will appear.

After all, sometimes the appearance of the information can almost be as important as the actual information. To this end, TurboCalc gives you control over a variety of formatting options. You can choose which font you wish to use, its size, style, its alignment and even its colour.

The program also has a wide selection of graph types to choose from. It has pie charts, line graphs, 3D and 2D bar charts, point and step charts. Given the right data you can even create a sin wave. If you decide you don't like the way the data looks in its current chart format, you can simply click on the chart type menu item and it will be changed to the chart type of your choosing instantly. Once you are happy with the output you can save the graph as an IFF file so it can be easily included in a DTP document.

FEEL THE POWER

One of TurboCalc's most powerful features is its macro language and ARexx support. Both of these can be used to provide added functionality and perform automated functions that can save both time and effort. A full program written with TurboCalc has been supplied as an example worksheet. However, don't expect to create any masterpieces unless you have some programming experience – it's fairly complicated.

Macro instructions are entered like any other value or text entry. To distinguish it from a formula or a numeric input by placing a = sign in front of the input. After you've done that, you can enter any command or menu item. For example, you could create a macro that generate a graph from the current sheet and then save the graph as an IFF or print it out. You can also ask TurboCalc to run a set of macros at boot-up.

SHIP AHOY

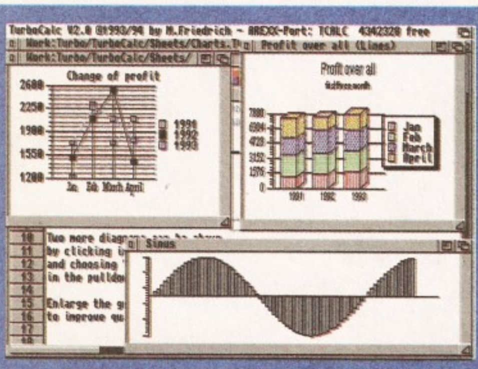
Navigating your spreadsheets is very easy. You can either select cells using your mouse, or by using a combination of the cursor keys, the tab button and return. Pressing tab will move the selection along the current row. The return button can be configured to act in several ways.

The sheet options can be used to make the return button move your position left, right, up or down. To make a multiple selection when using the mouse as a controller you just hold down the left mouse button. Using the keyboard you can do so by holding down the shift key.

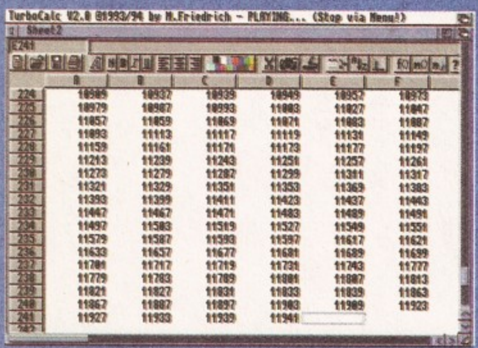
This package certainly delivers in terms of power – it has plenty of features and its macro language and ARexx support are certainly welcome. Spreadsheets are not particularly easy things to learn how to use and TurboCalc is no exception.

Although, its on-line help can help spreadsheet-newcomers become acquainted with the program's features, if you are looking for your first spreadsheet you should first try a simpler PD or shareware package.

TurboCalc is really for those who have an understanding of spreadsheets, but need more power and flexibility. The only gripe I have with this program is its manual, which very hard to follow at times. AS



sometimes the appearance of the information can almost be as important as the actual



TurboCalc has the usual spreadsheet features, such as input of formulas, text and numbers.

WHAT
TurboCalc V2.0 – £59
WHO
Stefan Ossowski's Schatzruhe
WHERE
Power Computing
☎ 0234 273000

CHECKOUT
TurboCalc V2.0

Features 92%
This package is loaded with powerful features.

Ease of use 83%
Like any spreadsheet you need to invest some time and effort to get the best out of the program.

Documentation 70%
Patchy and quite confusing.

Value 78%
It could be a bit cheaper – say £40.

Overall rating 88%
This is an incredibly powerful program, but really only worth shelling out for if you are really going to use its abilities.

EMPLANT

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Blittersoft

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The Macintosh emulation module is a 'generic' Macintosh with the speed of the emulation depending on the processor your Amiga is using. An A3000 is equivalent to a MAC IIci. An A4000 is equivalent to a Quadra 900. Support for up to 16 colours is provided for non-AGA machines. A4000 owners can use a full 256 colours! Up to 24 bit (16 million+) colours is supported using third party video boards such as: Picasso II, EGS-Spectrum, Vivid-24, Rainbow II, Rainbow III, Visiona Paint, Merlin, Retina, Retina Z3, Piccolo, EGS110/24, and OpalVision! Built in multiple file transfer allows for quick, easy transfers between the Amiga and MAC emulation. Support for AmigaDOS devices, Scanners, CD ROM, MIDI, SyQuest removable drives, Printers, Modems etc. Full stereo sound is supported too! Requires Macintosh ROMs (not supplied).

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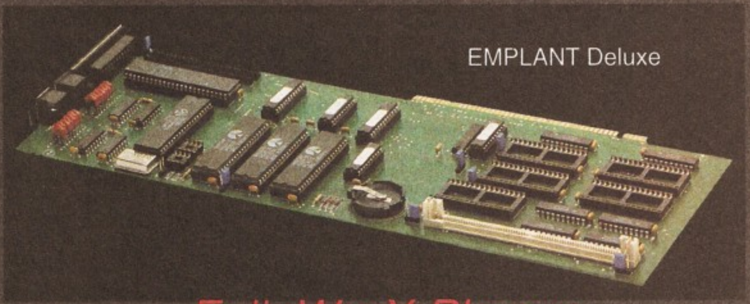
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PhotoWorX (PhotoCD software, inc. save/edit etc.) £69.95

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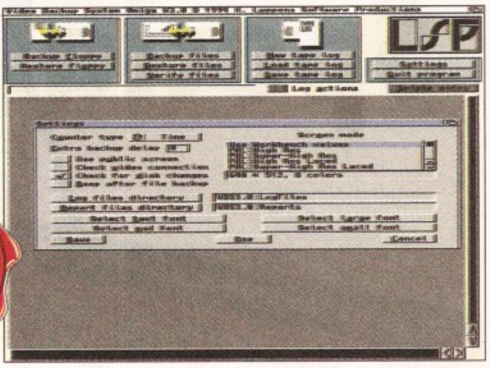
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Cheap Back-ups?

Richard Baguley investigates the latest version of a revolutionary system which can back up your hard disk to video tape.



The VBS software is pretty easy to use, and the new version allows you to do partial back-ups and restores of a disk.

Way back in issue 26, Wilf Rees looked at a rather unusual bit of hardware. This was the Video Back-up system (VBS from now on), which allowed you to use a normal domestic video recorder as a back-up device for your hard disk. He said it "will give you a convenient, cheap, accurate and innovative way of securing the data on your hard disk". Since then, the software has been severely overhauled, so it's about time we had another critical look.

In terms of hardware, the VBS doesn't exactly look awe-inspiring. All you get for your sixty odd quid (sixty five for the SCART version) is a single cable, which plugs into the composite out and serial ports of the Amiga. On the other end is either a phono lead (which goes into the Video in socket of your video) or a SCART style plug, which goes into your SCART socket. The software comes on a single disk, and the manual is a pretty simple thirty five page affair, although it does a pretty good job of explaining how to use the system.



This, believe it or not, is what the data looks like as it is being backed up...

One thing that you should bear in mind is that this system does need an Amiga with a composite video out socket. The only model which doesn't have this is the A3000, so this really isn't suitable for this machine, although the programmers do market a device which converts the RGB signal into a composite one, so this might be worth investigating.

There have been various enhancements for the latest version of the software, but the most important ones are the speed of the back-up and partial restore. If you have a 68020 or higher, there is a fast mode, which the programmers claim will double the amount of data that you can get on to a tape. Data compression has also been added, which allegedly triples the amount of data. Both of these modes seemed to work, and did indeed give a significant speed increase (see the box headed "Back-up Sizes for more details"). The new version requires Workbench 2 or above, but the programmers have also included version 1.5 on the disk, which will work with any Workbench version.

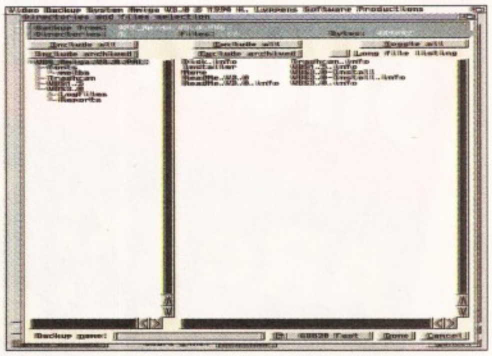
I hate to admit it, but I'm not really sure exactly how this system works. I mean, I realise that the software uses the video signal to encode the data being backed up, but how exactly does this get read back into the machine? How do you get the serial port to make sense of a video signal? Answers, on a postcard please, to...

Given the way it works, the system is going to be very sensitive to both dirty heads on the recorder and dodgy tape. To be safe, I'd seriously recommend that you stick with a decent branded tape and regularly clean the heads on your video, as the smallest glitch on the recorded signal (which you may not even be able to see) could result in data loss.

Always verify your back-up after it has been taken, just to make sure. It also doesn't seem to like restoring tapes from video recorders other then the one which was used for backing up, so it's not really suitable for moving large amounts of data from one machine to another.

If it's some really important data you are dealing with, you would probably be best off taking two back-ups using separate tapes, in case one gets damaged somewhere along the line. You may think that I'm being paranoid, but just you wait until you loose several weeks of work through a dodgy back-up which you didn't check properly. Accept the word of one who has learned through bitter experience.

As with any system for backing up data, the bottom line is usability and reliability, and on both counts this system scores well. It's not as fast as a dedicated tape streamer, but it's a hell of a lot cheaper. It's a lot easier to use than disk based systems such as AmiBack or Quarterback, as there is no need to continually swap disks. Previous versions could only work with entire disks or partitions, but this new version allows you to back-up or restore individual files or directories. It still has its quirks and it's certainly not the fastest back-up system on Earth, but it works. All you need to do is to nick your Granny's video recorder for an hour or so, and you can have a secure back-up of your valuable data on your hard disk. AS



The software now has the standard Workbench 2 look, which makes it much easier to use.

BACK-UP SIZES

I did a few tests with the VBS system to see how much data you could fit on to a tape using the various modes the software supports.

	.5 Mb1	Mb P/M2	E1803
Standard	70	.42	77
68020 fast	47	.63	114
68020 compressed	39	.76	138

1. The time taken to back up half a megabyte of data.
2. The speed in Megabyte per minute.
3. The (approximate) amount of data that could be fitted on to a 3 hour video tape.

WHAT
Video Back-up system 3.0
£65 (SCART Version)
£60 (Phono Version)
WHO
Lyppens software Productions
WHERE
Power Computing
☎ 0234 273000

CHECKOUT
Video Back-up System 3

Documentation 85%
Fairly minimal, but it tells you what you need to know in a very easy-to-understand way.

Ease of use 75%
The software is still a bit awkward, but by and large it's pretty easy to work with.

Features 90%
the ability to restore or back up selected files from a back-up is extremely welcome.

Value 90%
Comparable in price with most commercial back-up programs and somewhat cheaper than a professional tape streamer.

Overall rating 90%
An extremely cheap and innovative way to back up disks, although it's not all that quick.

Special AMIGA SHOPPER book offers



AREXX

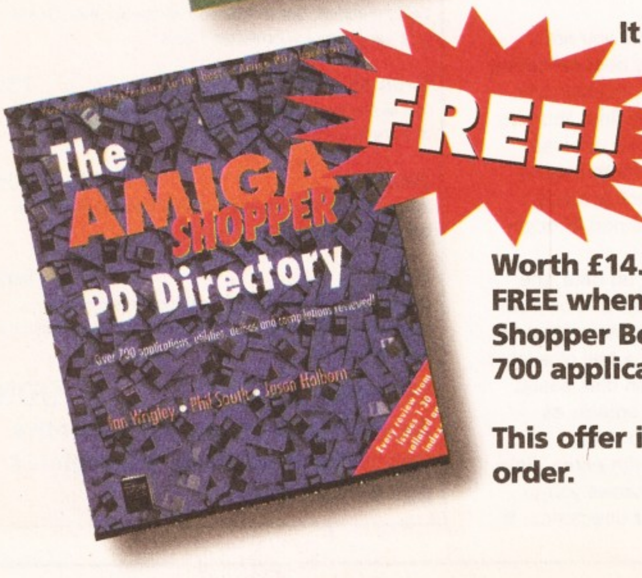
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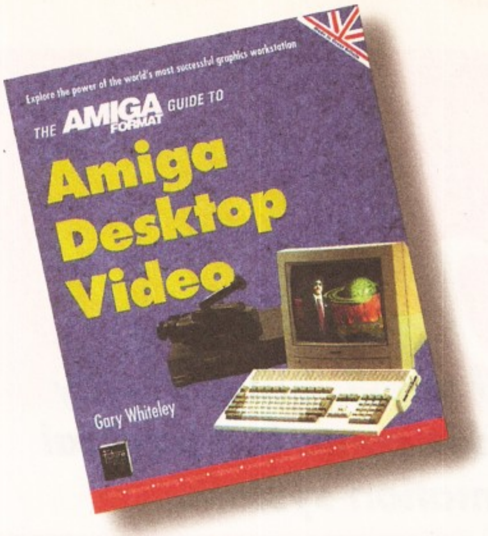


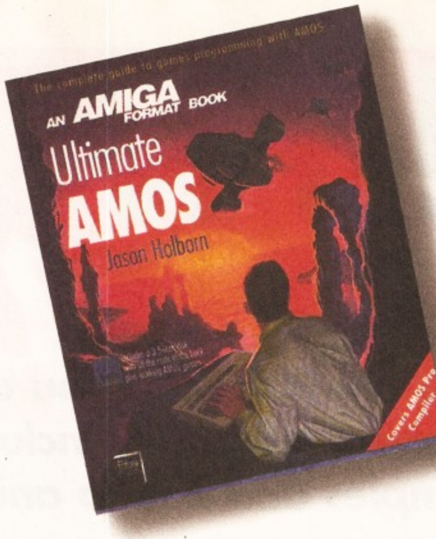
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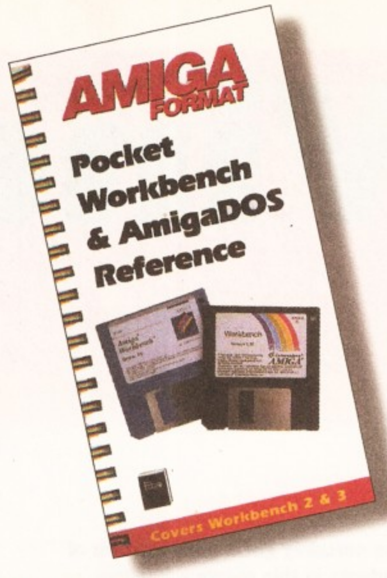
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Window Shopper

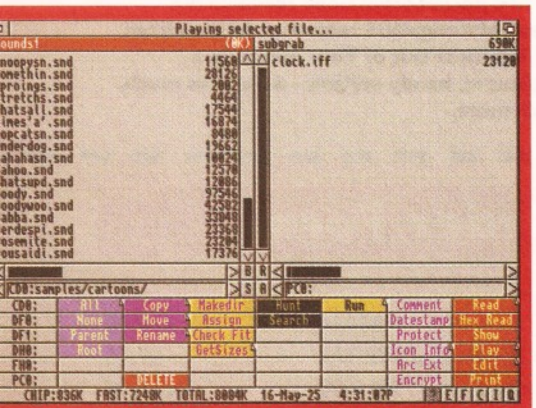
This month's collection of small, but perfectly formed, programs includes some fun musical samples and a logo animation system.

We've certainly got a good mixture of products in this month's Window Shopper. A CD full of samples, a flying logo-generator and an external clock.

SOUNDS TERRIFIC

This CD-ROM lark is really taking off, almost every aspect of computing has several CDs devoted to it. One of the few areas to remain virtually unscathed is samples and music modules. In an attempt to make up for this deficiency, Weird Science have compiled a CD-ROM collection of samples, midi files, music modules and music utilities. The compilation is called Sounds Terrific and comprises two full CDs. It's been designed for the PC as well as the Amiga so some of the files will not be usable without conversion software.

The discs have the usual directory structure, with drawers for Amiga samples, modules, midi files and PC Voc and Wav samples. However, while disc 1 has something for everyone, the second disc only contains music modules. This makes it more of a pain for PC-owners since they have to run them through the conversion programs – serves 'em right for buying PCs. Right, that's the last time I mention PCs.



Sounds Terrific has plenty of great samples. Here is just a part of the cartoons directory.

The first directory I went to was the Samples drawer, to be more specific, the Cartoons directory. As I suspected, this gave me the chance to have some fun and drive everybody else in the office nuts. This directory contains plenty of wacky sound effects, most of which conjure up mental images of violence and general absurdity.

However, the best ones are of cartoon characters' speech. Of course, there are several of Bugs Bunny's favourite catch phrases. But, there are also plenty of humourous excerpts from other cartoons. My favourite is Daffy Duck saying "you're despicable" – his maniacal laughter isn't bad either. Other good ones include Yosemite Sam having one of his little temper tantrums and some classic Elmer Fudd phrases.

The movies directory also has some great sounds, although as with most of the samples, I'm not entirely sure of their legality. Some of these are quite lengthy, for example the Raiders of the Lost Ark sample is almost 2.5Mb in size and plays for a mammoth five minutes. This directory also contains samples from such movie greats as Star Wars, Robocop, Startrek, 2001 and ah... the Wizard of Oz.

The Instruments directory will be of interest to musicians. It contains absolutely loads of instruments. Unfortunately though, the names of the instruments are pretty bizarre, which means it can take you absolutely ages to find a particular instrument. The quality of the samples is quite varied – some instruments are crystal-clear while others are badly garbled.

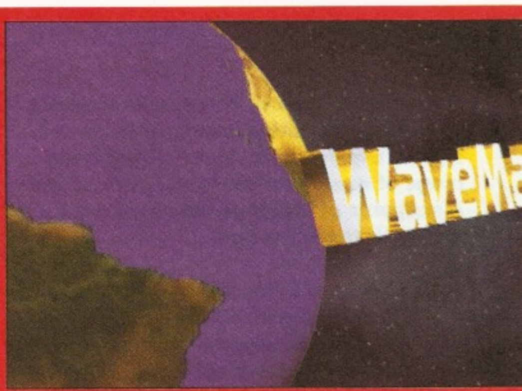
There are loads of other directories on this disc covering all kind of sounds. You'll find things such as machines, voices, vehicles, nature and even animal calls. However, while there is certainly an abundance of sounds I'm afraid that quality is slightly suspect. You find some good and some bad, one or two have been compressed poorly and very few of them loop properly. The other annoying thing about the samples is that some are powerpacked without any indication that they have been compressed – most annoying.

The music modules are just as plentiful. There's a wide selection too, you'll find jazz, classical, rock, house, ambient and even an unsettling number of chart songs. Although they are pretty good on the whole, I don't think Jimi Hendrix would have been too impressed by the module that bears his name.

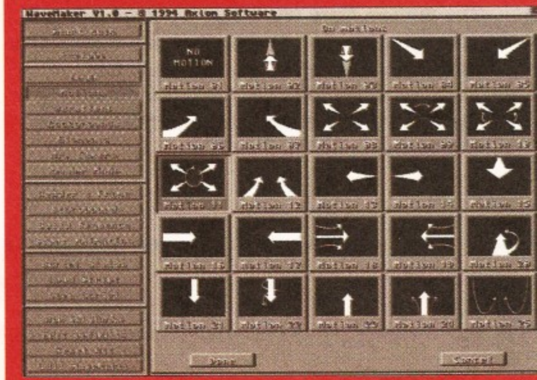
All in all this is a good collection which is relatively good value – if only through sheer volume. But the quality of the samples is a little disappointing and the variation in their volume is little short of infuriating. The disc also seems as if it had been hurriedly put together, with some of the files being repeated and even some icon files that have been renamed incorrectly as samples. It's not a bad collection and certainly a great deal of fun – for the first hour at least.

Product: Sounds Terrific
Price: £19.99
Supplier: 17 Bit software
Tel: 0924 366982

Overall Rating 76%



This is a frame from an animation created using one of WaveMaker's prefab scenes.



One of the best things about WaveMaker is that it comes with a wide variety of smooth motions.

WAVEMAKER

After reading last month's review of LightWave 3.5, I'm sure you can see why the program has become so popular. Quite simply, it is incredibly easy to use and has an excellent range of powerful tools. But some people are never satisfied and want things to be even easier. That's quite understandable, especially if you're working to a tight deadline. WaveMaker is a program, from Axiom Software, the makers of PixelPro, that has been designed to make the creation of flying-logos in LightWave even easier.

For those of you who don't know what a flying-logo is, it's basically a small animation that features a company's logo spinning and flying around the screen. It's the sort of thing you see in bank TV adverts and at the beginning of some programmes.

Even though LightWave can be used to create such animations, it still takes time and effort to produce top-quality results. WaveMaker makes creating flying-logo animations easier and less

time-consuming. Any LightWave object can be loaded into WaveMaker and then used in the creation of an animation.

One of the most important aspects of creating effective flying-logo animations is a smooth flight path. WaveMaker has several built-in motions, so you don't have to fiddle around creating your own motion paths. The program can also incorporate several elements other than your logo, by loading them into different layers. WaveMaker has several "Prefabs". These are pre-defined animations that your logo can be added to.

The Prefabs are the ultimate in convenience animation making. There are 16 very different animations to choose from. They each have a different style and make use of different elements, but they are all pretty cool. Because of the variety you are bound to find a couple that will suit your current requirements. One of the most complicated Prefabs is Universe Opening. This is very similar to Universal Pictures opening sequence, where their logo spins into view while orbiting the Earth.

Two of my favourites, being an avid Sci-Fi fan, was Mysterious and Punch It. Mysterious is a rip-off of the Doctor Who tunnel that you'd see at the end of the show. Punch is more than a little reminiscent of the old Star Trek opening titles. Your logo appears from the bottom of the screen, moves to the centre and then zooms off into the distance, complete with moving starfield.

An alternative to using Prefabs is to use the program's Smart Anim feature. This function will randomly create an animation with any given logo. However, it's not called smart for nothing, the program will avoid clashing colours and other undesirable combinations. The drawback to using this method is that animations created by the computer will tend to be on the conservative side.

The best way to get unique results, however, is to create your own animations – yes that's right, get your hands dirty and use some initiative! Well, actually you don't need to exercise that much initiative, rather you need to be able to choose between several options. To create an animation from scratch you'll need to select your logo and then decide on which motions you would like to apply to it.

Of course, being the helpful little program that it is, WaveMaker comes with several motions built-in. These pre-designed motions range from straight-forward swooping approach right through to fancy-smancy-spinning-around-and-stuff ones. As far as WaveMaker is concerned, there are three states that can be used to define the object's motion. The first state of any object is it's On motion, quite simply this is the motion that the logo will follow on the way to its Hold position. The Hold position describes the logo's orientation and position (is this the same thing Anna? [Yes it is. You're obviously feeling a bit disorientated Graeme – Anna][Get on with it -*Ed*]) when it stops to give on-lookers a chance to appreciate its finer details – or something. The third state is the Off Motion that the logo will follow off the screen.

The On and Off motions are basically the same, but in reverse. The motions requester displays the different motions by using combinations of arrows. These arrows give an impression of the motion the logo follow in all three dimensions. The Hold position requester will display an image that depicts the logo position on the screen and the direction it is facing.

Once you're happy with the motions and Hold position of your logo, the next thing you'll need to do is specify the duration of all of these states. This is very simple to do. You can just select which aspect of the logo's motion that you wish to adjust and then increase or decrease the period of time that each motion will take. This figure will be shown in seconds and frames.

WaveMaker also has plenty of other tools to make your animation more attractive. One of the most important things to consider when creating a flying logo animation is the background. WaveMaker can create a solid background, a gradient, an image or a sequence of images.

WaveMaker's selection of elements can also add to the appearance of your animations. These elements are a collection of still or moving objects, such as a starfield. This feature can be surprisingly effective, especially if you have several elements in one scene.

The program also has several other useful tools to help make creating your animation easier, such as story boarding and sequence-building. However, the program is not completely perfect and I did have a spot of trouble trying to get WaveMaker to communicate with LightWave 3.5. It just couldn't seem to recognise it. Fortunately the program is due for an update soon and hopefully it will recognise this new version of LightWave. Otherwise this is an excellent product. It has plenty of helpful tools and the objects and motions can always be saved and used in other projects.

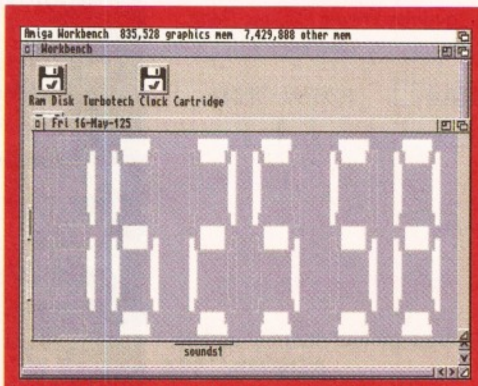
Product: WaveMaker
Price: £99.99
Supplier Future Publishing
Tel: 0225 822511

Overall Rating: 87%

TURBOTECH CLOCK

Time is funny stuff – sometimes it passes all to swiftly and on other occasions it can proceed at an agonisingly slow pace. So what's all this pseudo-philosophical talk in aid of? Well, whatever activity you may engage in time is often an important factor. Computing is no exception – in fact, there are tasks that are only possible if your computer is able to keep track of time. For example, one important thing you can do is make timed backups

If you have not got a clock fitted in your Amiga, installing one is easy. However, you can't add one to your machine without opening it up. This can present a problem if you are a proud owner of a A1200 that is still within its one-year warranty. If you open your machine then the warranty will be invalidated. The solution to this problem is to fit an external clock unit. Until recently there haven't been any, but now there are two – the original Kyte Products unit and the Turbotech which we will be looking at now.



The Turbotech is a clock, pure and simple.

"This CD-ROM lark is really taking off – almost every aspect of computing have several CDs devoted to it."

The clock's physical characteristics are not particularly noteworthy – but it's not as if you'll be wearing it on your wrist or anything. It's a small cartridge, about 6x5.5cm, that closely resembles a dongle. Unlike Kyte Product's clock, which is attached to the Amiga's serial port, the Turbotech unit fits onto the floppy drive port of your machine. One advantage of using the drive port is that there is no need for a thru-port. Amiga floppy drives can be daisy-chained together, so if you have an external drive already, you can simply plug the unit into the back of that drive. If you have any other drives, you can simply plug the cartridge into the last drive of the chain.

Although I was a little concerned about the fact that the clock would be attached in this manner, on using the clock I encountered no untoward effects. Installing the clock is extremely easy, quite frankly, you would have to be more than a few K short of a Megabyte not to be able to do it. You just plug it in and you're away and from henceforth your Amiga will be able to monitor the passing of time with the greatest of ease.

The software installation is also very straight-forward. Rather than take the easy route and use Commodore's Installer utility as most software packages do nowadays, the Turbotech has its own installation program. The program asks where you want the software installed and then copies across all the necessary files and alter your Startup-Sequence for you. However, don't expect to be able to abort the installation mid-way through, as you can't.

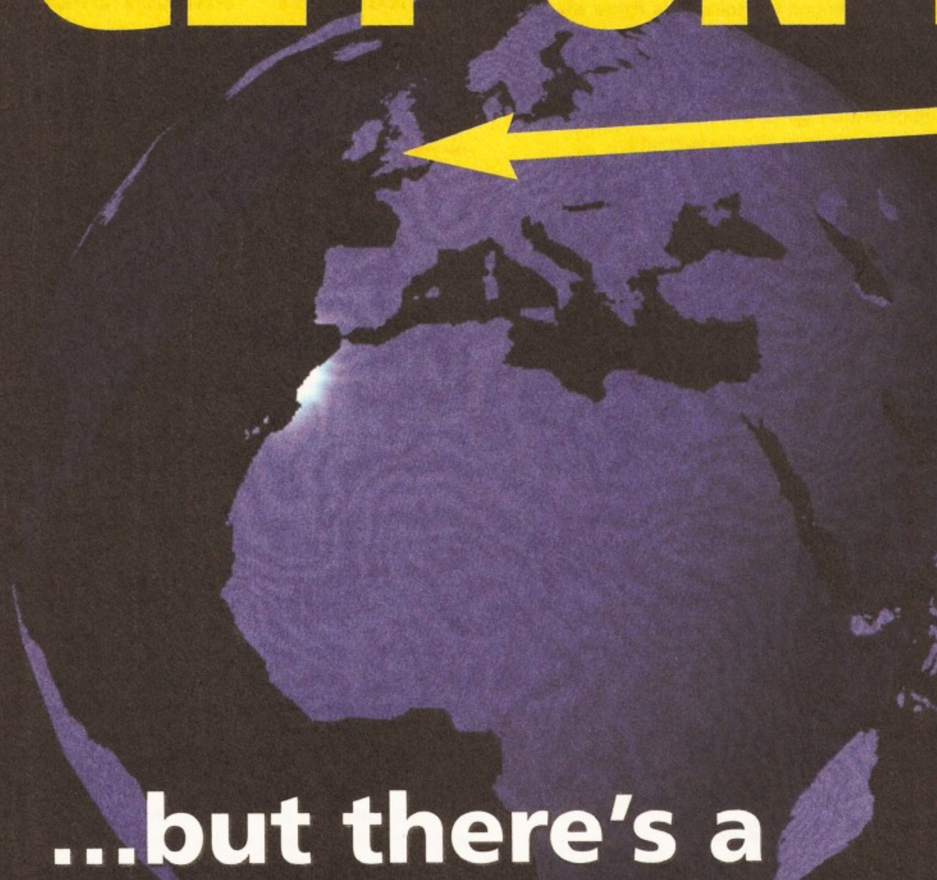
Unfortunately, there isn't much in the way of software supplied with the clock. As you might expect there is a program to display the time, but there is nothing else – no diary or calendar, not even an alarm. This is more than a little disappointing. While it may be true that there is no shortage of such tools in the PD sector, it would have been nice of them to include one or two with the package.

The lack of software is really the only gripe I have about this product. While some people may think a small one it is the only "real" distinguishing factor between this clock and Kyte Product's. While they use different ports to attach themselves to the Amiga and they are pretty well-matched in terms of features – after all a clock is clock. The lack of any utility software means that it loses out to its only competitor, in overall value, as the software provides added functionality and greater utilisation of the clock itself.

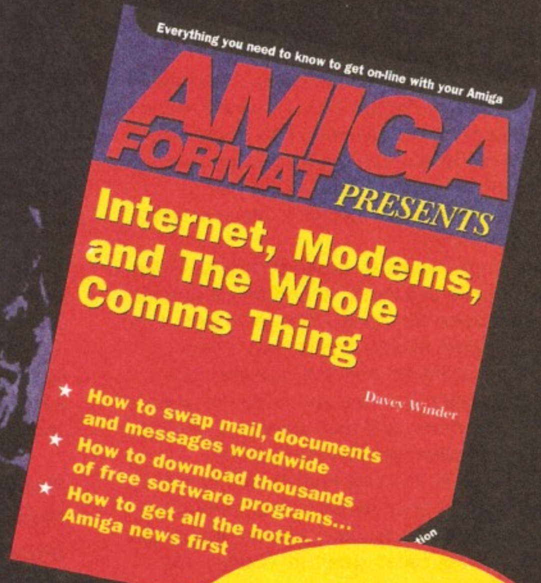
Product: Turbotech clock cartridge
Price: £19.99
Supplier: Siren Software
Tel: 061 724 7572

Product Rating: 83% AS

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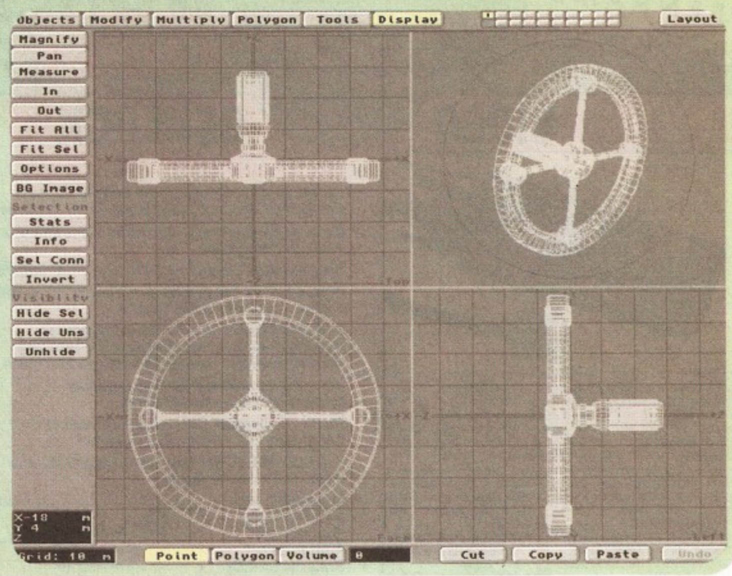
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Straight Talk

You read the reviews of Raptor and LightWave in last month's Amiga Shopper. This month our US correspondent, R. Shamms Mortier, has had the rare pleasure of a chat with the man behind these outstanding products – Tim Jennison, President of NewTek.



Newtek have recently released Lightwave as a stand-alone program.

With the release of the PAL LightWave package, all ears and eyes in Europe are staying tuned to NewTek for any hint of new videographic products to come. Tim Jennison, NewTek's president and chief visionary, is a very busy man these days, what with the release of the NewTek Flyer non-linear editing system and the Raptor (NewTek's rendering speed engine).

Trying to tap into Mr. Jennison's busy schedule for a chat is rather like trying to grab onto a 707 on take-off,... it's difficult at best.

A few weeks ago, however, Mr. Jennison was kind enough to give this reporter a few moments of his precious time to respond to some questions of interest to Amiga Shopper readers.

Can you reflect for a moment on NewTek's history?

NewTek is coming up on its ten year birthday as a company, and it's been a pretty amazing decade. We've gone from a company with one employee to changing an entire industry. We're based in Topeka, Kansas.

I'm not sure what the English equivalent of Topeka would be, but we're sort of thought of as a backwards town full of farmers. This isn't true, but Topeka isn't New York or San Francisco either. Of course, that's good in a lot of ways. I had my lab in my garage, which is also where some of the initial Toaster development happened.

> **"We want products that people can use to do real work."**

Back in the early days of DigiView, I went to the Los Gatos, California lab where the Amiga was developed and met Jay Miner. He'd heard of DigiView and was interested in it, but had never seen one.

Well, I just happened to have one with me, so Jay and a few other technical types gathered around and we hooked it up. And when we turned it on, it didn't work!

So I tried to figure out what the problem was and thought it might be the humidity. We got a lamp and aimed it at the DigiView for awhile, and sure enough, that made it work. We were thinking of including a lamp with every DigiView, but in the end decided to encase it in epoxy.

Any other interesting reflections on that important meeting?

Jay said he almost didn't include HAM mode because he didn't think anyone would use it. DigiView showed him that someone actually used it.

Of course, when I first invented DigiView I ran around the garage I was so excited. Now, nearly ten years later, coming out with a video digitiser wouldn't be a big deal at all, but at the time it was really something.

Who gets the credit for LightWave?

Most of the credit for LightWave's success must, of course, go to its principal programmers, Alan Hastings and Stuart Ferguson.

There seems to be a myth in computing circles that the more people you throw at a project, the better it will be and the faster it will get done.

LightWave was written by two people who know 3D graphics inside and out, both as programmers and as users. Stuart and Alan have also known each other for years and years. They were childhood friends, and in looking at their results, they must have a continuing good relationship.

> **"We have the very best BETA testers in the world, because the people who push LightWave 3D to its limits are the top special effects wizards in Hollywood."**

What about LightWave's recent ports to other platforms?

We recently announced that we would port LightWave to the PC and SGI platforms, in addition to the Amiga.

LightWave 3D has really established itself as the professional standard in 3D graphics, but you certainly can't remain a standard by only being available on one computer platform.



The creators of the graphics for Babylon 5 (Foundation Imaging) and occasional Amiga Shopper cover artist have been heavily involved in the process of beta Testing LightWave.

What makes LightWave such a hit?

With processor power increasing at the quick pace that it is, 3D work is becoming more and more practical for people to do. If you've ever suffered through an eight hour render time, as was the norm just a few years ago, you know that speed counts. With chips like the Pentium, Power PC, and of course the '060 becoming available, suddenly the speed issue is no longer the main issue.

The big barrier to people using the 3D packages is vanishing, and LightWave is the logical candidate to be king of the hill. It's affordable, it's professional, it's got high-end users, and it's very easy to use.

What is your personal favourite LightWave feature?

The ease of use features are very important to NewTek. We want products that people can use to do real work. Unlike many other packages on the Amiga, this is not a program that throws in a bunch of features just to have a cool feature list.

When we add features, we do it in a logical and consistent way, and our users really appreciate that. There's a reason that people in Hollywood are using LightWave, and there's a reason that they don't use those other programs.

How about the Hollywood connection? How important is it?

We really have the best BETA testers in the world, because the people who push LightWave 3D to its limits are the top special effects wizards in Hollywood. LightWave is now being used on most every TV show that is using 3D graphics, including shows like Star Trek, seaQuest DSV, and Babylon 5. The people who do these shows are on production schedules, and they use LightWave all day, every day.

Having Hollywood as our BETA test site allows us to add features that people need, as well as some things they never knew they wanted.

For instance, one of LightWave's new features is the Modeler's MetaForm function, which allows users to create smooth aerodynamic objects very easily. This feature allows you to create objects similar to those created with "MetaBalls" (a fairly high-end modelling feature) but with a much simpler and more practical user interface. Users create basic shell objects, then use MetaForm to create curved, organic shapes with them.

What excites you about the LightWave user?

Many of the people working on these big productions weren't professional animators until they got LightWave 3D. Some of them were people like Ron Thornton, who's worked in special effects for years and saw that 3D graphics is a more flexible way to go than traditional modelling.

"Believe me, when we have a PAL Toaster we'll be shouting it from the rooftops."

Many of the artists working on the shows have never worked in TV before. They are regular human beings who went out and bought LightWave, learned it, got very good, and now their work is being seen on television every week.

What about a PAL Toaster?

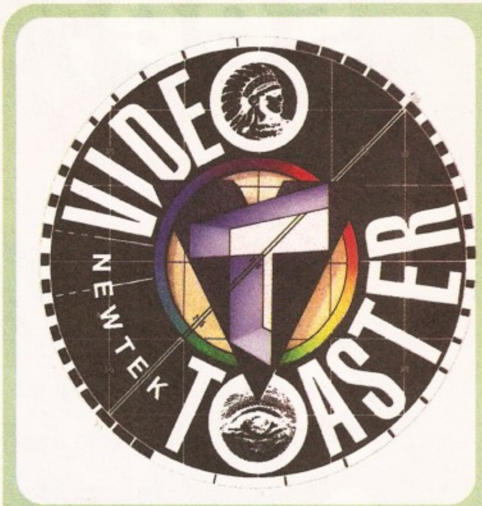
There have been a lot of rumours about a PAL Toaster, so let me end those rumours. There won't be a PAL version of the Toaster that we make and sell in the States. There are technical reasons for this, and the best advice that I can give to anyone who's looking for the Toaster in PAL is the Passport Transcoding TBC System. Now does this means we have no plans to support PAL or the European market?

"Our goal in general with NewTek is to keep coming up with innovative products at amazing prices."

Obviously, the release of LightWave in Europe shows that this isn't the case, but we will not be doing it with the PAL version of the Toaster.

It's not as if we could do a PAL Toaster and choose not to. So there's the bucket of cold water, and now for the ray of hope. You'll note that I said there's no way of making the *current* Toaster work in PAL.

But if we had a new design, well, I'll leave Europe something to gossip about. This is just a ray of hope, not an announcement.



Newtek's Video Toaster has caused something of a stir in the US TV community. It's now recognised as the best video effects unit you can get for the money.

Believe me, when we have a PAL Toaster, we'll be shouting it from the rooftops. If you have work to do now, but the Toaster-Passport combination. I was very impressed with the Passport. I didn't think it would work when I first heard about it, but when it was explained to me I said "yep, that'll work". The PAL Toaster right now is the Toaster with the Passport.

What about future goals?

My goal with the Toaster system from the beginning has been to create a video production "magic box" that does all of the major functions of an editing suite at as low a price as possible.

The Flyer, our new tapeless editing system, completes the picture beautifully. The Flyer is initially an NTSC only editing system, but it's the shape of new developments on the way from NewTek.

We figure that users can put together a complete system from scratch for around $15,000 US, which makes the Toaster-Flyer combination about $25,000 US – much cheaper than any competitive system with anywhere close to comparative quality.

"Obviously, the UK users are really a breed apart – maybe the most rabid Amiga users in the world."

And any closing remarks?

Our goal in general with NewTek is to keep coming up with innovative products at amazing prices. We're looking forward to our next ten years and we'd like the users in Europe to know that we're thinking of them.

Obviously, the UK users are really a breed apart – maybe the most rabid Amiga users in the world, and that means they are interested in video and graphics... just the sort of products we create here in Topeka. Stay tuned! AS



Long before Art Department Professional was even a twinkle in a programmers eye, Newtek were supplying 24 bit image processing programs (although they weren't very complex ones). Transfer 24 was supplied with their revolutionary Digi-view video digitiser.

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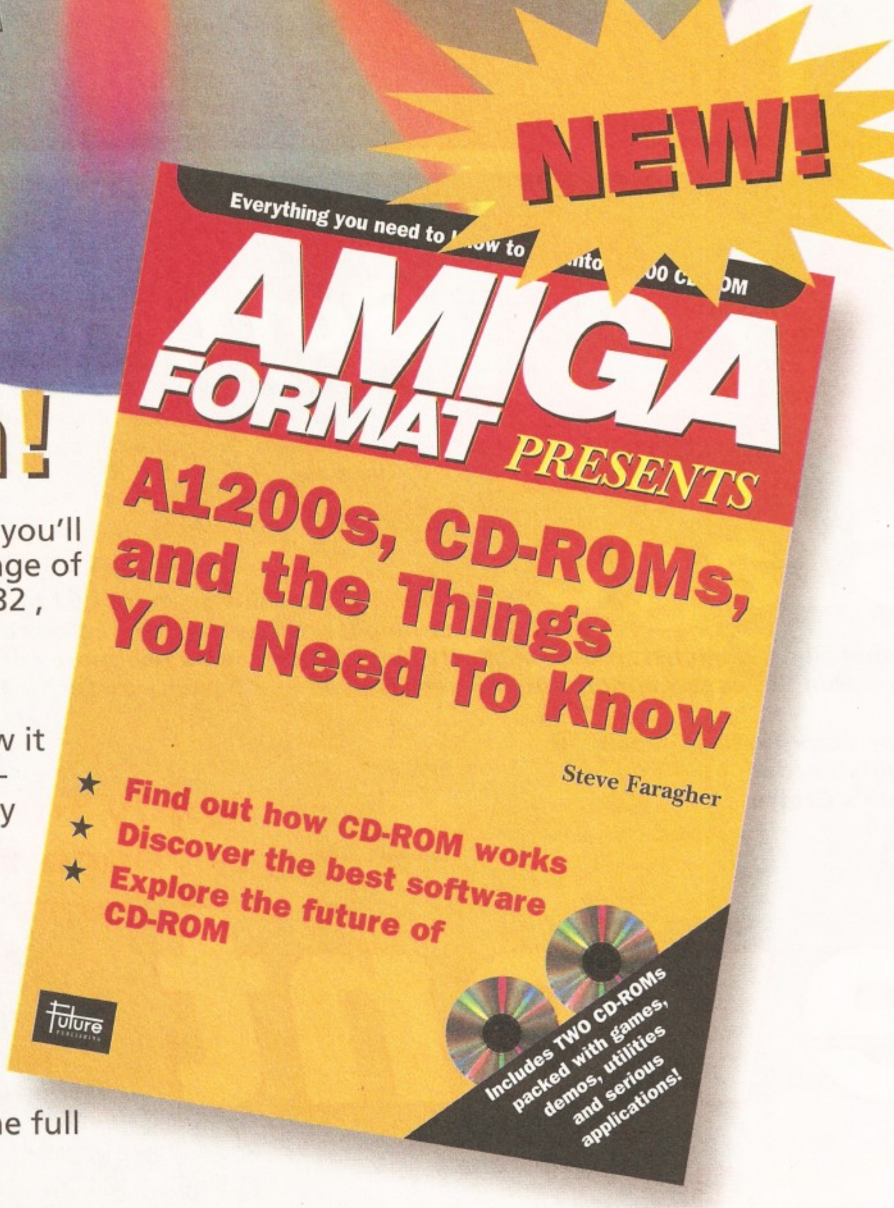
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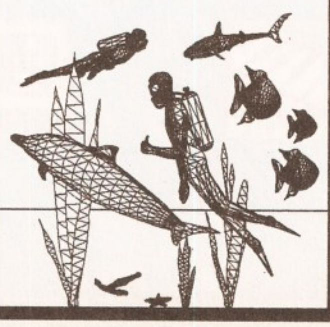
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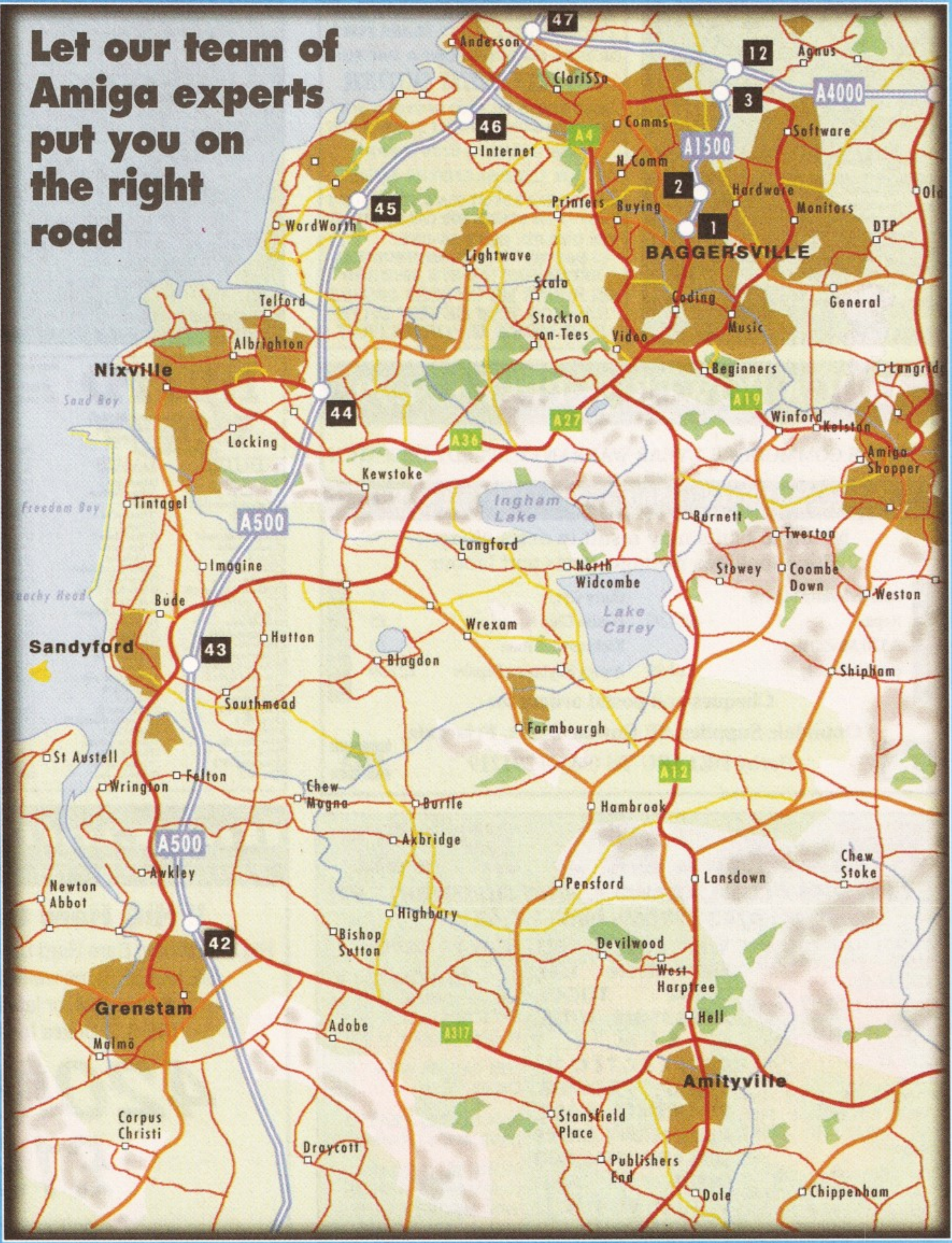


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USING THE ICONS TO FIND WHAT A QUESTION'S ABOUT

BEGINNERS Beginner questions raising basic problems.

GENERAL General Amiga-related queries or questions.

DTP Queries related to Amiga desktop publishing.

MONITORS Questions about monitors and TV displays.

HARDWARE Queries relating to general hardware problems.

BUYING Questions asking for buying advice in any area.

PRINTERS Printers, drivers and hardcopy problems.

CODING Coding problems (no matter which language).

VIDEO Queries about using your Amiga with video.

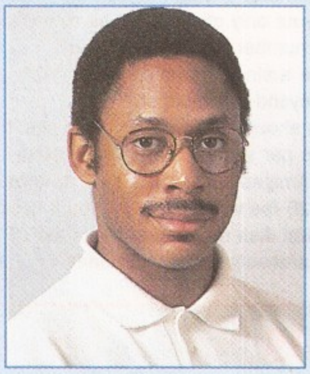
MUSIC MIDI, sampling, software and synths.

SOFTWARE Software packages and programs queries.

COMMS Questions relating to comms, including modem.

AMIGA ANSWERS

NO PROBLEM!



Graeme Sandiford is in.

Hello and welcome once again, to the area of *Amiga Shopper* where you can turn to find all the answers to questions concerning your Amiga. It's my privilege, as *Amiga Shopper's* technical writer, to make sure that not one of your problems is left unsolved. Don't worry, we can help – no matter how simple or complex they may be. At *Amiga Shopper* we want you to get the very best out of your Amiga. That's why we devote more space than any other magazine to this indispensable service, so please make the most of it and keep your questions coming in. We'll do my very best to find a solution to all your problems.

Don't worry if you come across any unfamiliar terms, just turn to one of our jargon-busting boxes to receive an explanation. The problems are put in a wide context for everybody's benefit. The index on the previous page is your guide to the topics covered this month.

By now, you are probably familiar with our team of Amiga experts. **Mark Smiddy** knows all there is to know about AmigaDOS and floppy drives. **Jeff Walker** is our desktop publishing, fonts and printer correspondent. **Gary Whiteley**, is a trusted expert on video applications and graphics. If you have a query about comms, we'll set our communications guru **Dave Winder** on the case. **Toby Simpson** is our code clinician. If you've got problems with anything from C to assembler, try taxing his little grey cells. Finally, we've got a man you can rely on when it comes to operating systems programming – **Paul Overaa**.

SMASH AND GRAB



I have a well-expanded Amiga 1200 (including 40 MHz 68030 accelerator and FPU, 8Mb RAM, 340Mb hard drive and two colour printers) with which I use the following software – Wordworth v3, Superbase Personal 2 and Superplan.

I use the above mainly to produce the church news letter, business stationery and I'm thinking about producing wedding stationery and the like. I have a friend who has his own business and he would like to incorporate a picture of his truck into his business stationery so this query has to do with digitising and grabbing images and using them with my Amiga. I also read in a magazine that a reader had personalised his wedding stationery by incorporating a photo of the church into it. This struck me as a brilliant idea.

What I would like is advice on the following:

1) What would be the best paint package to buy, DPaintIV AGA, Brilliance v2 or another?

2) What flatbed scanner would you recommend, and what software to go with it?

3) Will the scanner software and the paint package be compatible?

4) How can I generate 'scalable' clip art for use with my Wordworth package?

5) Can you explain the differences between 'normal' and 'scalable' clip art?

6) Can you recommend any sources of scalable clip art that I can use with Wordworth?

7) Which digitiser would you recommend? I've been considering the Vidi Amiga 24RT, but I'd like to hear your views.

8) Would there be any gain in my fitting 50MHz crystals to the GVP accelerator board, as opposed to the 40MHz ones already fitted (if this is possible)?

9) Should I consider more RAM, and if so, how much?

Gordon McLeod
Netherton, Lanarkshire

1) Here's a difficult one. Ideally I'd say get both, but if you can only afford one I'd go for Brilliance. Or wait until we see what wonders Deluxe Paint V (due soon, I guess) holds.

2) Another difficult one this, seeing as I don't know how much you want to spend, or what quality you will probably require. But the Epson scanners are very good, though you'll need to buy some driver software (as supplied by ASDG – from Meridian Software) and a cable, though if you have ImageFX (from Silica) there are scanner drivers included which will most likely do the job.

3) You'll probably need to convert the scanned (or grabbed) images to a format which your paint or DTP program can understand, although some programs can load 24-bit or 8-bit greyscale images. Again, if you had ImageFX you'd be able to use it to convert images. So while Brilliance could load the 24-bit image you'd still have to convert it for use with Wordworth, for instance. Take note that a pretty comprehensive conversion facility is included with the Vidi 24 software, however.

4) The answer is that you can't! At least not on an Amiga. Wordworth uses both CGM (Compugraphic Metafile) and GEM (as in Atari) formats but nothing which is directly compatible with Amiga programs such as ProDraw or PageStream. Digita are planning a converter sometime in the future but that's no help to you right now. If you have access to any PC software which can output CGM files then you could be in business, but as far as producing scalable clip art for Wordworth on your Amiga goes then forget it.

5) 'Normal' clip art images are bitmaps, just like those images produced by a paint package such as Deluxe Paint. This means that the images are made up of discrete pixels and that when they are scaled they become jaggy or chunky. 'Scalable' clip art is based on mathematical vectors which are used to represent the various parts of the clip art image. Because they are mathematical, rather than physical bitmaps, such clip art images can be scaled with little, if any, apparent quality loss.

6) Any CGM clip art disk should be suitable. Since CGM is a PC standard a look in the ad sections of any PC magazine should bear fruit. Why not try throwing any further questions at Digita themselves (Tel: 0395 270273) Yes, go for the Vidi Amiga 24RT, it's a great digitiser which should work well for what you need to do.

8) I don't really know the answer to this. I'd hazard a guess that if GVP didn't do it then there's a good reason, but I'm sure somebody else around here will know better (so how about giving us an answer, Toby or Mark?).

9) How long is a piece of string? The perennial problem of how much RAM you need depends on what you need to do. As it stands your 8Mb should be fine, but of course if you hit major bottlenecks then the only solution is to add as much extra RAM as you need (or can afford). Not a very good answer, I know, but the only way to tell if you need extra RAM is when you start hitting memory problems which can be resolved in no other way.

Gary

MEMORY BLOCK



I am an animator with film experience but I'm new to the world of Amigas. I have an Amiga 500 with 1Mb memory and I want to create animation sequences lasting between twenty seconds and four minutes.

Working with Deluxe Paint IV I find that I have a limit of between eight and twelve frames before I run out of memory. I'm finding this very frustrating!

I need to be able to play back ten to twenty second chunks from a sequence and rework the frames as necessary, direct from memory, to really get going. I intend to market my work (and so I'd like to invest in a system which can produce professional results) – finally recording it to BetaCam, though for the time being I can store tests and build up sequences on VHS.

I would also like to use my Amiga to line-test the movement of my other drawn and 3D-animations. Is the Rombo Vidi Amiga 12 AGA digitiser suitable? Again, it's being able to store sequences of several seconds at a time which is most important to me (rather than having superb image quality).

I'm happy to buy second-hand and hope not to spend more than £600 for the whole system, although I don't mind replacing the A500.

I would really appreciate your advice on what computer, RAM, hard drive, programs and other accessories I would need to get.

Toby Penrose
London

"I have an Amiga 500 with 1Mb memory and I want to create animation sequences lasting between twenty seconds and four minutes."

With your present setup you're never going to get very far. For graphics and animation 1Mb of RAM is barely enough to even get started, never mind do any serious work – but I think you've already found this out!

The bad news is that it's likely to cost rather more than the £600 you mention to attain the system you wish to have. For a start, ten seconds of animation is made up of two hundred and fifty frames (or around half that if you work on twos). Now, there's no way to say *exactly* how much memory will be required to hold these 250 frames, as much depends on the content, resolution and differences between consecutive frames, but if you were to do a simple 16 colour flying logo in hi-res interlace (to achieve a reasonably professional look) you'll find that lots of memory is required.

As an example I knocked up a simple 250 frame anim of my first name in 300 line capital text flying onto screen in 16 colours, hires interlace, max overscan (you'll usually need to use overscan for video work).

The result was an animation which required 626740 bytes of storage – although typically this would be higher as I only used a single colour for the text and another for the background. Out of interest I also noted how much RAM was required to run DPaint IV AND make the animation – just over 3.5Mb! This should give you an idea of the minimum RAM requirements you're going to need, though I'd double it if I were you.

You'll also have to find somewhere for permanent storage of your animations and I'm afraid floppy disks aren't going to help much here, so, as you say, you're going to need a hard drive and anything under 120Mb just isn't worth bothering with nowadays.

In order to get a reasonable playback speed you'll need an accelerated Amiga, otherwise your animations will look jerky because the Amiga just can't process them fast enough. If you can't afford this option then your only choices will be to reduce the resolution or number of colours in your animations or use a single-frame recording VCR (which is again beyond your budget).

However, you should be aware that you won't get full 25 frames per second playback because even the fastest Amigas just cannot shift data that fast. To get true 25 fps video playback you'll need an expensive digital disk recorder such as the DPS PAR, and as you probably know, this needs to

MOST FREQUENTLY ASKED QUESTIONS ABOUT... COMMS

I have connected to my local BBS with no problems, but the text that I see is missing characters and so doesn't make much sense.
This is most likely a parity error – check that the parity setting is correct for the BBS that you are calling. Usually this is 8.N,1(8 Bits, No Parity and 1 stop bit) but some systems prefer 7,E,1 so it's worth checking.

Another explanation could be a flow control error, when the data (the messages on the BBS) are sent to your computer the flow has to be stopped and started every now and then so it can be stored in memory or on disk.

If the data is received faster than the computer can handle the buffer will fill up and overflow, causing some of it to get lost. Flow control helps to ensure this doesn't happen, and the most common method used is RTS/CTS handshaking. ***Dave***

Every time I try to connect to any Bulletin Board System all I end up with is a screenload of garbage – what gives?
What gives is almost certainly one of three things:

1) Check that the comms settings are correct, yes it's the 8,N,1 or 7,E,1 business again.
2) Check that you are connecting at the right speed. It is no good setting a baud rate of 19,200bps on your modem if the one you are trying to talk to only supports speeds up to 2400bps.
3) It could be line noise, in which case check with British Telecom to see if they can help. Line noise is the result of a poor telephone line, or a poor connection. If the latter then calling back at a different time should solve it. ***Dave***

What are "V" numbers, you know like V32 and now V34. What do they mean?
These refer to a modem's speed usually, although sometimes it can be a reference to a type of error correction. The V numbers are, in fact, telecommunications standards that are agreed by a body called the International Telecommunications Union (ITU-T).

The ones you will see most commonly are:

V.21	300 bits per second
V.22	1200 bits per second
V.22bis	2400 bits per second
V.32	9600 bits per second
V.32bis	14400 bits per second
V.34	28800 bits per second
V.42	An error correction standard
V.42bis	An error correction standard with data compression.

Dave

My modem appears to dial without any trouble, but then straight away I get a message saying "NO CARRIER". Is it my modem or my communications software at fault?
Neither, it is most likely that there is another telephone, for example, and extension, that has been left off the hook. The modem dials OK but cannot complete the call. ***Dave***

What is the Internet and how do I use it?
The Internet is a global network of computer networks, a massive web of comms connections through which you can send Email, get files, browse for information, use on-line services to name just a few things that are possible. It's estimated that there are currently around 30 million people using the Internet all over the world, so don't get left behind.

"I'm always reading about it, but nobody can explain in simple terms what it is."

To use it you will need an Internet account which you can get through a "Service Provider". For full details, including who to call and how much it costs, see the main feature in *Amiga Shopper* 40 (see the back issues pages for more information on how to order your copy). ***Dave***

What does RS-232C mean? I'm always reading about it, but nobody can explain in simple terms what it is, or does for that matter.
RS-232C, usually just referred to as RS-232, is the industry standard for the serial port interface. It dictates what the pins on the serial port actually do, and by being a standard helps to ensure that cables and ports should be able to talk to each other without any hassle.

There are 25 pins in the RS-232C standard, but only 9 of these are used in most comms applications. These 9 important ones are:

1 Equipment Control
2 Transmit Data
3 Receive Data
4 Request to Send
5 Clear to Send
6 Data Set Ready
7 Signal Ground
8 Carrier Detect
20 Data Terminal Ready

Dave

Is there a BBS in my area I can call, and do you have the telephone number?
There almost certainly is – publishing a list of them all, however, is a bit like climbing a tree whilst covered in lard, possible but slow going.

The best thing is to connect to any BBS you have the details of and ask there, most actually carry the telephone numbers for other BBSs, and you will always get a warm welcome if you were to pose the question in the relevant message area.

To get a number in the first place you can either ask a friend who has a modem already, keep your eyes peeled in these very pages, or by a copy of the book "Internet, Modems, And The Whole Comms Thing" by Davey Winder which has a whole host of highly recommended BBSs in its BBS Directory section.

Also check out the User Groups pages in this excellent magazine. ***Dave***

What are "Hayes Commands"?
Hayes are one of the founding fathers of modem technology, and in 1978 they introduced a series of modems that used a special command set to allow software to communicate with, and control, the modem.

Because these modems sold so well, the command set soon became the industry standard. Most Hayes Commands are prefixed with "AT" which stands for "attention" and is used to wake up the modem.

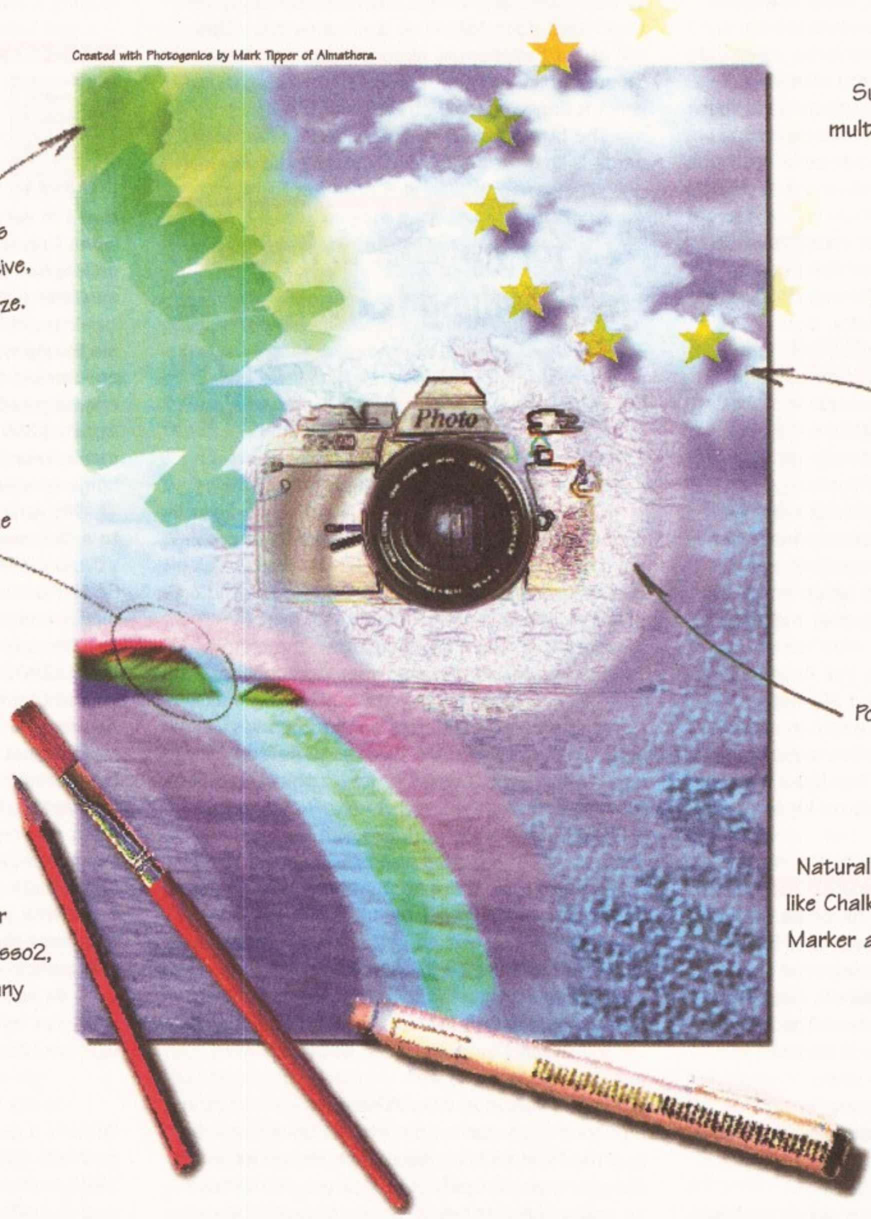
If you want to ensure that your software will be able to talk to your modem, then get one that supports Hayes Commands. ***Dave***

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be fitted in a Zorro slot, so it won't work with any of the non-"Big Box" Amigas such as the A500 and A1200.

You'll also need a good genlock or RGB encoder in order to output your animations to video at a reasonable quality. If you are going to be recording to BetaCam then you'll need the best quality you can afford – and that will be at least 250 (for something like GVP's G-Lock). You may be tempted to try using a modulator with your A500 but you'll soon tire of the quality, especially if you are using high-quality VCRs such as BetaCam.

So your best bet would appear to be a second hand Amiga 1200 fitted with a hard drive and at least 8Mb of memory. Initially you could use the A1200's composite video output until you can afford a good genlock. You'll also need an RGB monitor to do accurate colour work and a second floppy drive would be handy too.

As for software, in addition to your DPaint IV I'd recommend you check out ClariSSA (it came free on the cover disk of Amiga Format 61) and a shareware program called MainActor. Both ClariSSA and MainActor are animation utilities which you should find useful. You might also find an image processing program such as Art Department Professional or ImageFX handy, but wait until you've sorted your hardware out first.

I'd also recommend that you get hold of a directory utility such as Directory Opus because it will save you a lot of time and trouble when it comes to moving files around, as well as facilitating a host of other chores which would otherwise entail much tiresome typing and visits to the Shell.

Finally, yes I reckon Rombo's Vidi Amiga 12 would be suitable for your line and 3D testing work, but again you'll need to have plenty memory on board (and probably a hard drive) to get any meaningful sequences together. You know the rest of the drill – good lighting, camera on tripod or rostrum, etc. ***Gary***

24-BIT CARD REQUIRED

BUYING

I would be grateful for some advice. I need a 24-bit graphics card for my ancient A2000! Having read the reviews of six of them in issue 41 I'm still none the wiser! The card I was thinking of was the Picasso II RTG but the review was inconclusive on this one.

What I need most from the card is:

(a) maximum compatibility and reliability with my system,

(b) speed – I hate slow things and

(c) a card which works with a single monitor setup (preferably).

My budget for the card would be £400-£500 and I would like to use it for 3D modelling and animation, hopefully going out to video, as well as some video processing and mixing graphics with a video source. (I've still to sort out a genlock/TBC/framegrabber as I can only afford so much at once).

The software I use is VistaPro 3.0, Makepath, Imagine 3.0, ImageFX, DPaint IV, Scala 500 HVT and, if I can get it to do what I want to, ClariSSA. Oh, and good old Directory Opus as well... Any help would be greatly appreciated.

Tony Baker
St Mary Cray, Kent

I guess that you're much more confused by the range of options which appear to be available to you, rather than by the round-up of graphics cards in AS41, eh?

Anyway, since you want to output video and you don't have a Zorro III slot in your Amiga you basically have two choices which fulfil your budget needs. The first (as you mention) is the Picasso II, though you'll also need the optional video adaptor, which costs around £150 extra.

Your second choice would be the OpalVision card, for which you would also need an RGB-Video converter or a good genlock to convert its output to video (contrary to what the round-up says, the OpalVision does NOT have a video output – this will be part of the now almost legendary Video Module which will cost around £700 extra, if and when it finally hits the streets).

The biggest difference between these two cards is that the OpalVision is purely a display card which lets the Amiga's output be displayed on any standard RGB monitor whilst the Picasso also allows any suitable software to be re-displayed on screen to the highest possible resolution (depending on the capabilities of your monitor). This means that if you want your Workbench, Imagine 3 or other program to have a large, flicker-free display on a multisync monitor then it's possible to configure the Picasso to do this. You'll need a multisync monitor to take advantage of this feature, however.

> ***"As for the speed, it sounds as if nothing is going to be fast enough for you, so you just have to learn to live with it."***

Both cards come supplied with a range of software, including a paint program (in my opinion OpalPaint is one of the best 24-bit paint programs on the Amiga) and other utilities. From a personal point of view I've had an OpalVision for nearly two years now and I'm very happy with it, and I don't really need high quality screens for other software (though occasionally I think it would be nice). I've used the OpalVision with most of the software you mention and it works well.

Both Picasso and OpalVision work with single monitor setups and on the whole I think you'll find that the Picasso and video converter will work out cheaper than an OpalVision/Genlock combination, as well as provide better screen output for your software (though the 24-bit displays won't exhibit very much difference, if any).

As for the speed, it sounds like nothing is going to be fast enough for you, so you'll just have to learn to live with it. ***Gary***

AMIGA IFF TO PC DISPLAY

GENERAL

Can you please tell me where I can get software which will enable me to output a DPaint IFF image on a 486 PC? I have an Amiga 1200.

Russell Humphries
Redhill, Surrey

The obvious solution is to buy a copy of Deluxe Paint II Enhanced for your PC and then just format a PC disk on your Amiga using the CrossDOS program supplied with the Amiga's operating system, copy the IFF image to it, run DPaint on the PC and load your image from the disk.

There are other PC programs which will load ILBM files such as those produced by DPaint on the Amiga, including the excellent shareware program GWS (Graphics Workshop), which you should be able to obtain from any good PD library or by downloading from a suitable BBS.

In each case the method of transferring the file will be the same – use CrossDOS to format an MS-DOS disk and then transfer the file across to the PC by copying it to the MS-DOS disk and loading it into the PC software. ***Gary***

DISCONNECTED A1200

HARDWARE

I have been a subscriber to *Amiga Shopper* for nearly two years and find the information contained within its covers to be very valuable and helpful. However, I still accept that I'm very much a novice with the Amiga when I read of the many tasks that you and your colleagues can perform on this wonderful machine.

I would be very much obliged if you can help me in any way with the following problem concerning the connection of my VCR to record and play back titles that I have produced on my Amiga 1200 (with the help of that absolutely marvellous Scala program) for my camcorder-shot home movies.

My Amiga setup is a basic A1200 connected to a Commodore 1940 multisync monitor. My VCR is a Mitsubishi B82 SVHS which has both a SCART connector and a good selection of other inputs and outputs. I do not yet own a genlock.

The 1940 is connected into the video port on the A1200 with a co-ax cable. I have tried connecting the Amiga's composite output to the RF input on the VCR but without any success.

I've just been re-reading the October '93 issue which shows several methods of connecting up a VCR but none of them seem to meet my requirements. A friend has told me that I require a lead with a SCART plug on one end and the other end with open flying leads and fitted with phono plugs but if this is so where do I connect the phono plugs and where do I purchase such a lead?

I do hope that you can make sense out of what I'm trying to explain and maybe shed some light on to my problem.

Robert Ayre
Nunthorpe, Cleveland

Without a genlock there are essentially two methods for recording graphics from your Amiga 1200 to your VCR. You've already got close, but you've made a fundamental mistake by trying to connect the Amiga's composite output to the VCR's RF input because these signals are incompatible. However, if you were to connect the Amiga's *RF* output to the VCR's RF input you'd be in business, albeit at the expense of not achieving the best possible transfer quality, as RF-conversion tends to degrade the Amiga's output somewhat.

A better solution is, as your friend suggested, to get a SCART cable with flying phono leads at the other end. These are widely available in specialist video and electronic stores. What you'll need to do then is plug the SCART end into your VCR and the Video In (or perhaps Out – I always get confused by this) connector to the Amiga's Composite video phono socket. If you've been lucky your SCART cable will be compatible with your VCR (for all it's claims to be a standard, there are several variations of the SCART connector employed by different manufacturers)

and you'll be able to record your graphics at much-improved quality.

If the latter process proves unsuccessful, don't despair immediately. It may be that the SCART connections to your VCR are slightly different to the 'standard' and you'll need to modify the cable so that the composite signal from your Amiga actually goes to the designated input pin for your VCR, so you'll need to check your manuals and resolder the lead so that it is correctly connected for your setup.

Lastly, since you seem rather confused about video signals in general, I'd like to suggest that you consider buying a copy of my book (Amiga DeskTop Video by Gary Whiteley) which is available by mail order from Future Publishing (Tel: 0225 822511) or from good bookshops, though you'll probably have to order it. ***Gary***

THOSE OLD MONITOR BLUES (PART 5001)

MONITORS

I have an A500 Plus running WB2.04 with various snazzy extras. I've also recently purchased a second-hand AOC CM-326 multisync colour monitor complete with a home-made video lead which connects the 23-pin computer output socket to the 15-pin monitor input socket. Having opened the 23-pin plug I found that only the following pins were connected: 3, 4 & 5 (Analog Red, Green and Blue)10 (Composite sync)17 & 18 (both being grounds). Are these the only pins which should be connected or should I buy a professionally-made cable?

I understand that the monitor was sold for use with the Amiga but it was designed primarily for PCs and the manual provides very little help as far as connecting and setting up is concerned. Perhaps you could assist me with the functions of the various switches? I can only get a screen display when the rear-mounted switch is in the Analog position.

Should the "Preset" switch be on or off? In the on position I get a small gap at the bottom of the screen. Moving the "Width" switch up considerably reduces the width of the display. The "Text" switch appears to make no difference whatsoever, and neither does the "Colour" switch.

I make considerable use of Final Writer and now wish to obtain the best results on my monitor using Scala and Dpaint. Can I get a flicker-free display from my setup?

E.T. Gardiner
Tonteg, Mid Glamorgan

Firstly, the connections look fine and if the cable works for you (which you seem to imply that it does) then I should stick with it.

As for the preset switches, it hardly takes a genius to realise that since you've got the analog signals connected then the Analog setting will be the only one which will produce a picture. As for the others, I'm sorry, I haven't a clue what the best settings will be for your requirements. You'll just have to keep experimenting until you get the monitor set up as best you can. Obviously some of these switches only affect PC displays, so they won't all work in your case.

Finally, you won't be able to get a flicker-free display from your Amiga 500 without the addition of a 'flicker-fixer' type card to your 500. These are getting quite difficult to get hold of nowadays but some companies might still be able to get them for you, though I don't know where. You'll have to do some ringing round but a good place to start would be the larger distributors such as Silica, Gordon Harwood and White Knight Technology.

The reason you'll need a flicker fixer is that the Amiga 500 can only output 'standard' video at 15.6KHz and to obtain flicker-free images on your AOC you'll need to supply it with at least a 31.2KHz signal. A 'flicker-fixer' doubles the Amiga's video output frequency so that it can provide a rock-steady image with a multisync monitor. You won't be able to use the higher frequency output for video work though, as it will be incompatible with any video equipment you have (because the PAL video standard works at 15.6KHz). ***Gary***

PROGRAM ERROR MESSAGES

GENERAL

I am relatively new to computing, not so young (retired), and am experiencing difficulty in getting some programs to run. I recently inherited a large number of program disks, many of which give a variety of error messages when I try to run them. 'Require command arguments', 'Unable to open your tool SYS:c/ppmore', Unable to open ASL library, 'Need Explode Library'.

I have the *Mastering AmigaDOS* books 1 and 2 and *Mastering Amiga Beginners* but would be pleased if you could give me any advice or perhaps recommend further books that may be useful.

R.G. Holland
Westbury, Wilts

You've not given any clue as to the programs you are having difficulty with, but if I explain some of the underlying issues I think you'll see how to tackle these sorts of snags. Many programs require access to routines that are stored in separate libraries. As well as the system libraries that come with Workbench a great many third party libraries also exist.

Now any special library required by a given program will doubtless be provided on the disk that the program is on but unfortunately that is usually not good enough – because the libraries needs to be present in the directory specified by the Amiga's LIBS: logical device name and this, since you are presumably normally booting from your Workbench disk, is usually assigned to the Workbench libs directory.

So, unless you are actually booting up from a program disk which sets up the appropriate system assignments (including LIBS:) to the the various directories of the program disk then programs will not look into their own disk's libs directory for any libraries they need – they'll look in the libs directory of your Workbench. All your missing library problems can therefore be solved by copying the appropriate libraries from your program disks to your Workbench libs directory!

It's a similar sort of situation with the 'Unable to open your tool' error messages that you are getting. The appropriate tools are not being found in your Workbench's c: directory and the solution is to either copy the tools from the c: directory of the program disk to your Workbench c: directory, or change the icon's default tool so that you specify the tool in question as being present on the disk of the program in question.

Suppose for instance you boot from your Workbench disk, insert a program disk called PROGDISK, and double click on an icon that says 'ReadMe' only to find an error message saying 'Unable to open your tool SYS:c/ppmore'. You'd then have two alternative courses of action: either copy the ppmore program from the c: directory of the program disk to your Workbench c: directory, or select the icon, choose the info option from the Workbench icon menu, change the SYS:c/ppmore default tool setting to PROGTEST:c/ppmore, and click on Save to make the changes permanent. After you've followed the latter pathway ppmore will be looked for on the program disk itself (and therefore found).

Some programs are designed to work from the Shell rather than the Workbench and here you often have to supply various parameters on the Shell command line. What you supply will depend solely on what the program expects and any error messages concerning missing parameters will depend on how the utility was programmed. There should usually be document files accompanying these types of utilities and these should explain what the program does and how to use it (including details of what command line parameters have to be supplied)! ***Paul***

ICON AND LIBRARY PROBLEMS

GENERAL

I have an A1200 with Kickstart 39.186 and Workbench 39.29 and an extra drive. My problem is with the EASYCALC program that was on the disk provided with issue 31. When trying the instructions and read mes, I get the notice 'Unable to open your tool c:more'. Also, when trying the EASYCALC program itself I get a notice saying reqtools library V38 not found. Flexer from the same disk works alright?

Eric Tilling
Great Grimsby

Project icons, such as the document files you are having trouble with, can have a default tool specified so that when you double click on the icon that tool is used with the project associated with the icon. Text file icons are usually given default tools that specify a text file editor or reader. These may be system tools such as ed or multiview, the name of a word processor program (such as FinalCopy_II), or some other utilities such as more, ppmore, and so on.In the case of Shopper disk #31 the icon specifies the 'more' utility in the form 'c:more' so when you double click on the icon the Amiga's O/S goes looking for the more program in the Workbench c: directory.

If you think about it the error messages you've been getting are telling you exactly what's wrong – the 'more' program is not in your Workbench command (c:) directory. You'll find 'more' in the c: directory of the issue 31 disk and if you copy this file to your Workbench c: directory you'll find everything works fine. Alternatively you can edit the default tools by selecting the icon and choosing 'Information' from the Icons menu.

Change the name of the default tool in the requester that appears to 'ed' or any other file reader that you do have in your Workbench c: directory, then click on Save to make the changes permanent. Again the document icons should then work as expected!

The notice you are getting about the reqtools library not being found stems from a similar problem. EASYCALC needs this library in order to run and for the Amiga's operating system to find it the library must be present in the assigned LIBS: directory (the Workbench libs directory in your case). You'll find this library in the libs directory of the issue 31 disk and again if you copy this library to your Workbench libs directory the EASYCALC

program will then work properly. ***Paul***

ELIMINATING UNUSED WORKBENCH FILES

PRINTERS

I bought an Amiga about a year ago to use for word processing and have been trying for ages to work out what to delete on my Workbench so that I can load Citizen Print Manager onto the disk. I have deleted things like the Clock, More and Say but still don't have enough room. Could you tell me what else I can delete?

Also is there any way I can alter the print that comes on the TV screen when using Kindwords 3, it's small and very hard to read. In the June issue of Shopper you reviewed a book called Best Amiga Tips and Secrets but there was no telephone number or address. Could you tell me where I can get a copy? Could you also tell me how I add a virus checker to my startup sequence!

Mrs C. Addison
Hull, Humberside

Firstly I take it that you are aware that you should only ever delete things from copies of your Workbench disk, never from the original (master) disk itself. Having made that point the most obvious route to more space is to delete all programs and files that you do not need for normal day-to-day operations. In addition to Clock and Say in the Utilities drawer Exchange could also go.

There are doubtless quite a few commands in the c: directory, like Sort, Join and FileNote, that could likely also be deleted. You can even remove things like your Preferences editors (the input, palette, font, pointer editors and so on) because preference settings are stored separately and the editors are only needed if you want to change those settings. Unless you change all your Workbench settings on a daily basis, those editors are simply sitting on the disk taking up valuable space. Depending on how your system is set up there will be many other files that can be removed.

You may for instance find additional printer drivers in your DEVS/PRINTERS directory that could be removed. Similarly there may be fonts present that you will not want to use.

One word of warning – even if you end up with certain system directories containing no files do not delete the directories themselves because this will almost certainly lead to problems when your machine starts up. Because every user's Workbench use requirements are different you will need to experiment a bit – after all it is you, and only you, who will know what utilities etc., you use on a regular basis.

Remember though that even if you do delete something and then find that problems arise it's easy enough to put right. Just get out your original Workbench disk and copy the file you deleted back into the appropriate directory on your Workbench copy disk. word processors, like Kindwords 3, allow you to alter font sizes and increasing these would make the TV displayed text easier to see. The trouble is of course that this sort of solution will affect the printed output as well so it's not really a solution as such.

If you are using your Amiga mainly for word processing I would recommend getting a decent monitor. You pocket may hurt a bit, but your eyes will thank you in the long run. The computer book you mentioned is listed in DTBS Books advert.

You can contact them on tel: 0706-715028. Adding a virus checker to your startup sequence so that it runs automatically as the machine boots is easy. The simplest thing to do is to place the virus checker program into your Workbench disk's c: directory and then edit your startup sequence adding a line containing the virus checker's name just before the last line of the script, ie just before the terminal 'EndCLI >NIL: statement'. ***Paul*** AS

FILL IN AND GET US TO ANSWER YOUR QUESTIONS

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please, also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. **If you have *several* questions in different fields that should be addressed to more than one of our experts, please send in your queries on *separate* forms.**

Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath, Avon BA1 2BW.

Name: ______________________

Address: ______________________

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____

Your machine:

A500 ❑ **A500 Plus** ❑ **A600** ❑ **A1000** ❑ **A1200** ❑

A1500 ❑ **A2000** ❑ **A3000** ❑ **A4000** ❑

Approximate age of machine:__________

Kickstart version (displayed at the "Insert Workbench" prompt)

1.2 ❑ **1.3** ❑ **2.x** ❑ **3.x** ❑

Workbench revision (written on the Workbench disk)

1.2 ❑ **1.3** ❑ **1.3.2** ❑ **2.04/2.05** ❑ **2.1** ❑ **3.0** ❑

PCB revision (if known). Do not take your machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for Workbench 1.3) __________

Chip memory available (see AVAIL in Shell) __________

Agnus chip (if known) __________

Extra drive #1 (3.5in/5.25in) as DF__: Manufacturer __________

Extra drive #2 (3.5in/5.25in) as DF__: Manufacturer __________

Hard disk: ____Mb as DH__: Manufacturer __________

Extra RAM fitted – type, size in Mb and manufacturer __________

Details of any other hardware which could help us to answer your question:

____

____

____

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

____

AS 44

I'M STUCK WITH MY PhD RESEARCH

I am hoping that you can help me with my research problem. I'm a lecturer at West Herts College doing a PhD in Image Processing with the University of Hertfordshire. My research is titled "Interactive Digital Image Processing using Colour Space Transformation".

I am transforming RGB colour space values to the CIE domain, and then performing shifts on the chromaticity co-ordinates. These shifted chromaticity co-ordinates, when transformed back to the RGB colour space, give an image that displays colour changes that were originally requested by the user.

I've spent a lot of time studying the layout of the IFF file format, and I've got information from Commodore and relevant books. However, I am having great difficulties finding a method for the extraction of the RGB data. I need to analyse the IFF file, extract the RGB data, process it, and then create a new IFF file showing the effect.

I have written the programs for colour space transformation, but I am not an experienced programmer and have only studied topics relevant to my research. I use the SAS/C Development System. I intend to work with 24-bit data, and I am not concerned with the time taken to process a file.

Mr A J Cook,
Debden Green, Loughton

The chunk you're after is the CMAP. I have not studied the specs for IFF-24, but I would like to believe that the CMAP chunk remained pretty much the same. When I read this I thought "hey, great, the iffparse.library will do this". I've had a look, and it seems a little over-complicated for what you're trying to do. It is quite easy to "walk through" an IFF file and find a particular chunk. Although I've a feeling that the following technique is a tad naughty, it will do the job for you:

- Open the file.
- Search through every chunk for the CMAP chunk.
- Note the position and size of CMAP and load it into memory.
- Pass the RGB values to your processing routine and then back into the CMAP we have in memory.
- Seek back to the start of the CMAP and write out the new version.
- Close the file.

I looked at this a couple of times and thought "It'll work, but the technique stinks". If you're feeling very adventurous you can investigate iffparse.library in the Library's Rom Kernal Manual Edition 3. Alternatively, to avoid wasting your time, you could adapt the listing accordingly.

I've written this to work under both SAS/C and DICE for those of you who are going to be interested in having a play. It's actually great fun! I've had it doing some very strange alterations to palettes. In order to change how a palette is altered, fiddle around with the ColourAlgorithm() function. I hope this helps. ***Toby***

```
**
** $Id:  iffchange.c
**
** Program for Amiga Shopper Answers section
** to allow an algorithm to alter an IFF ☛
pictures colour map.
**
** By Toby Simpson
**
** To compile under DICE:
**     dcc iffchange.c -o iffchange
**
** To compile under SAS/C, copy the ☛
Starter_Project
** drawer somewhere and
** create this source file in it. Double ☛
clicking on
** "Build" will build your project.
**
** To Use (From the shell):
**
** iffchange <filename>
**
** You will have to alter the ☛
"ColourAlgorithm" function yourself to
** make colour changes to a file!
*/

#include <stdio.h>
#include <stdlib.h>

#include <exec/exec.h>
#include <dos/dos.h>

#include <clib/exec_protos.h>
#include <clib/dos_protos.h>

/*
** IFF Chunk definitions:
*/
#define MAKE_ID(a,b,c,d)    \ ☛
   ((ULONG) (a)<<24 | (ULONG) (b)<<16 |
(ULONG) (c)<<8 | (ULONG) (d))

#define IFF      MAKE_ID('F','O','R','M')
#define ILBM     MAKE_ID('I','L','B','M')
#define CMAP     MAKE_ID('C','M','A','P')

/*
** Function prototypes:
*/
BOOL  ReadChunk(BPTR file_handle, ULONG ☛
*destination);
void  ColourAlgorithm(long colour_id, UBYTE ☛
*red, UBYTE *green, UBYTE *blue);
void  ProcessCMAP(BPTR file_handle, ULONG ☛
chunk_length);

/*****************************
**
** Main Entry Point.
*/

void main(int argc, char *argv[])
{
   BPTR     file_handle;
   char     *filename;
   ULONG    chunk_test;
   ULONG    chunk_length;

   /*
   ** Extract our filename:
   */
   if (argc != 2)
      {
      printf("Argument count incorrect: ☛
iffchange iff-picture-file-name\n");
      return;
      }
   filename = argv[1];

   /*
   ** Open the IFF file ready to process:
   */
   if (!(file_handle = Open(filename, ☛
MODE_OLDFILE)))
      {
      printf("Can't open file %s\n", ☛
filename);
      return;
      }

   /*
   ** Check if its a valid IFF file (Starts ☛
with FORM):
   */
   if (!(ReadChunk(file_handle, &chunk_test☛
)))  return;
   if (!(ReadChunk(file_handle, ☛
&chunk_length)))  return;
   if (chunk_test != IFF)
      {
      printf("Not a valid IFF file.\n");
      Close(file_handle);
      return;
      }
   if (!(ReadChunk(file_handle, &chunk_test☛
)))  return;
   if (chunk_test != ILBM)
      {
      printf("Not a valid IFF_ILBM file.\n");
      Close(file_handle);
      return;
      }
```

GAMES DEVELOPMENT

I am a newcomer to the Amiga world seeking advice on the technical aspects of games development. I am quite prepared to spend the required finance which will be involved, but freely admit to not knowing quite where my money would be best spent. To help me make the decisions, I would like to ask some questions. I currently use an A1200.

1. Would the cost of expanding an A1200 to the required standard for professional games creation make it more sensible to save up and get an A4000-T instead?

2. If, for example, one wanted to develop a game of the quality of "Beneath a Steel Sky", what would be the minimum hardware requirements to achieve this?

3. What development software would you regard as an essential tool-kit for the creation of a graphical RPG?

4. How can you animate digitised images of real people within a game environment? If you need top-end hardware and software to do this, how would such a game run on an unexpanded A1200? If I spend a fortune on the things necessary to create a game, how do you squash it down for use in a bog standard machine?

5. What language would you advocate, and why?

6. Is it possible to use both an Amiga and a IBM-PC to code on, or would that be a pain? I have no choice unless I can persuade my co-creator to move over to the Amiga!

Keith Fawcett
Chelmsford, Essex

1. If you need to save up to get an A4000-T, then the equipment you'll need to do a good job is likely to be too expensive for you. Professional games' development these days involves tens of thousands of pounds' worth of equipment alone, and then the huge number of people necessary to process and create reams of audio and graphical data required.

This all sounds very negative I imagine, but if you're thinking of making a living this way you're going to have to think very carefully. It is not nearly as easy as it sounds. Creating a commercial standard game *is* possible on very little, like an A1200 for example.

2. Well, you'll need a 400Mb hard drive, maybe more if you plan to use lots of audio and animated sequences. You'll need at least 10Mb of RAM, a faster CPU, and around a grand's worth of basic software, such as Art Department Pro, and SAS C. You'll also need a graphics artist or two!

3. It depends on what you are going to be doing. You'll need lots of it, that's for sure. If you're doing lots of animated work, then Art Department Pro is essential. If you're rendering

```
    /*
    ** Attempt to track down CMAP:
    */
    while (TRUE)
        {
        /*
        ** Read chunk ID and length:
        */
        if (!(ReadChunk(file_handle, ☛
&chunk_test)))    break;
        if (!(ReadChunk(file_handle, ☛
&chunk_length)))  break;

        /*
        ** If its a CMAP, process it:
        */
        if (chunk_test == CMAP)
            {
            printf("-- Found CMAP %ld bytes ☛
long, %ld colours expected\n",
                chunk_length, chunk_length/3);

            ProcessCMAP(file_handle, ☛
chunk_length);
            }

        /*
        ** Move to next chunk:
        */
        if (Seek(file_handle, chunk_length, ☛
OFFSET_CURRENT) == -1) break;
        }

    /*
    ** Close file if it was not closed by ☛
the error routine, and
    ** show operation as complete.
    */
    if (file_handle)     Close(file_handle);
    printf("Operation Complete\n");

    return;
}

/*****************************
**
** BOOL  ReadChunk(BPTR file_handle, ULONG ☛
*destination)
**
** Reads a 4 byte chunk in from the ☛
specified file, to the specified
** location. Returns FALSE for a failure ☛
(In which case the file is
** closed) and TRUE for success.
*/

BOOL  ReadChunk(BPTR file_handle, ULONG ☛
*destination)
{
    if (Read(file_handle, destination, ☛
sizeof(ULONG)) != sizeof(ULONG))
        {
        Close(file_handle);
        file_handle = NULL;
        return FALSE;
        }

    return TRUE;
}

/*****************************
**
** void  ProcessCMAP(BPTR file_handle, ☛
ULONG chunk_length)
**
** Routine to process a CMAP. It is passed ☛
the file handle and chunk
** length. This routine is responsible for ☛
calling ColourAlgorithm()
** for each colour in the CMAP.
*/

void  ProcessCMAP(BPTR file_handle, ULONG
chunk_length)
{
    UBYTE     *cmap;
    UBYTE     *current_col;
    long      current_pos;
    long      loop;

    /*
    ** Allocate memory for CMAP:
    */
    if (!(cmap = malloc(chunk_length)))
        {
        printf("Out of memory\n");
        return;
        }

    /*
    ** Note current position and read in CMAP:
    */
    current_pos = Seek(file_handle, 0, ☛
OFFSET_CURRENT);
    if (Read(file_handle, cmap, ☛
chunk_length) != chunk_length)
        {
        printf("Error reading CMAP!\n");
        return;
        }

    /*
    ** Process CMAP:
    */
    current_col = cmap;
    for (loop = 0; loop < ☛
(chunk_length / 3); loop ++)
        {
        ColourAlgorithm(loop, current_col, ☛
current_col + 1, current_col + 2);

        current_col = current_col + 3;
        }

    /*
    ** Write out new CMAP:
    */
    Seek(file_handle, current_pos,
OFFSET_BEGINNING);
    if (Write(file_handle, cmap, ☛
chunk_length) != chunk_length)
        {
        printf("Error writing new CMAP!\n");
        return;
        }

    return;
}

/*****************************
**
** void  ColourAlgorithm(long colour_id, ☛
UBYTE *red, UBYTE *green, UBYTE *blue)
**
** This function is called for every colour ☛
in the IFF File's CMAP.
** You alter the values at these pointers ☛
to tweak the RGB value and
** then exit.
*/

void  ColourAlgorithm(long colour_id, UBYTE ☛
*red, UBYTE *green, UBYTE *blue)
{
    intr, g, b;

    r = *red;
    g = *green;
    b = *blue;

    printf("Colour in = R %d, G %d, B %d\n", r,
g, b);

    /*
    ** Process colour:
    **      (For example purposes, this halves ☛
the brightness roughly)
    */
    r = r / 2;
    g = g / 2;
    b = b / 2;

    /*
    ** Replace colour into CMAP and exit:
    */
    printf("Colour out = R %d, G %d, B %d\n",
r, g, b);

    *red = r;
    *green = g;
    *blue = b;

    return;
}
```

Toby

sequences you'll need LightWave, or Imagine 3. If you're programming, you'll need a whole host of compilers, editors and debuggers, as well as numerous books.

4. That normally involves filming the subject, and then grabbing the frames on to hard disk. Those frames can then be processed into the format required using a package such as AdPro, and then formatted for use with the game itself. It's a big issue, and could potentially involve a lot of computer time and programming work.

5. If it's an RPG you're writing, I'd write as much as you can in non-machine specific C, and then consider porting it to the PC also, as that will potentially increase the game's value to a publisher – and it makes good commercial sense to get the biggest market you can.

6. See answer to number 5. You could develop on both machines simultaneously, and write small machine-specific routine packages to handle the Amiga or PC unique bits.

I wish you luck, but don't underestimate the size of the problem you have. Modern games are often programmed by large teams, and have several graphic artists dedicated to work on them. The development of a game is just part of it, you will have to sell it to a publisher, so it is going to have to be good.

Sadly, as games get more advanced and involve more resources, it is becoming harder and harder for a couple of people at home to make a success out of starting a programming business. (That's how I started out once upon a time.) ***Toby***

MORE AMIGA DEVELOPMENT

CODING

Soon, I will be purchasing an Amiga A1200 to learn assembler on because I would like to develop software. Is the A1200 a good choice or should I go for something bigger? I was thinking of getting the Blizzard accelerator and a hard disk.

Can I develop games on the A1200, or would a PC be better?

I hope you can answer my questions, as I have wasted about four months trying to find out if it can be done!

Mr D Boyda
Derry, Northern Ireland

You'll be frustrated to learn that I can't really answer your question. Without knowing what you're intending to program, or whether you're going to be doing this seriously with an aim to make a living out of it, it's hard to answer. If you're just planning on writing your own games, then an Accelerated A1200 with 8Mb of RAM and a few hundred Mb's worth of hard disk is fine.

As soon as you are planning on doing it professionally you will start looking at thousands of pounds' worth of kit, depending on the kind of game you are going to work on. On A1200 games sales alone, you are unlikely to be able to pay the bills, so A500/A600 compatibility may be essential. Also consider writing in C and not Assembler, which will make porting the game to the PC and other platforms easier for either yourself or the publisher of your game to do. You can always write the speed specific parts in Assembler on both platforms if you wish. ***Toby*** AS

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Assembler Part 3

Toby Simpson goes wild and introduces stacks and subroutines to add on to your list of useful Assembly Language concepts.

Last month we got our first Assembly Language program up and running, introducing some new instructions and concepts such as branching and addressing modes. This month we'll expand on these and introduce stacks and subroutines.

You will recall that at the end of every program we have written so far we have used the "rts" instruction. In the very first part of the course, we said that the "rts" instruction is "Return From Subroutine", and it transfers control of the microprocessor back to where your program was called from. With this in mind, let's introduce a new instruction, jsr – Jump to SubRoutine. Have a look at this little program:

```
move.l   #0,d0
jsrAddToD0
jsrAddToD0
rts

AddToDo  add.l #1,d0
rts
```

Have a guess what D0 will be when this program finally exits? If you guessed 2, you are right. So what's happened here? Firstly, we are setting D0 to contain zero, then we get to our first jsr instruction. At this point, the program jumps to the AddToD0 label in the same way it would with the branching instructions we introduced last month. So, we then add 1 to D0 and come to an rts. At this point the processor "remembers" where it came from and goes back, in this case ready for another call to our AddToD0 sub-routine. D0 now becomes 2, and the program will finally exit. Well, this is all very clever, but how does the processor know where to go back to? It's actually quite simple, and involves using the Stack.

A STACK OF PLATES

Imagine a table on which you are going to stack up plates, one on top of the other. It follows that the last plate you put on the stack will be the first off, because it is at the top. If you stack ten plates up, the first one you put on the stack will be the last you get back off it. It's fair to say that this is a first in, last out stack – FILO. The 68000 microprocessor manages a stack just like this. It has a pointer to an area of memory where it can stack numbers. This pointer is held in the Stack Pointer register, referred to as the sp register. In fact, the sp is A7. You will recall in the first part of this course we said that the 68000 has 16 general purpose registers, D0-D7 for storing data, and A0-A7 for storing data or address pointers. We also said that A7 doubled as the Stack Pointer.

As a programmer on a complex computer such as the Amiga, you very rarely will ever have cause to worry about where in memory the stack actually is. On the Amiga, each task which is created has its own separate stack, which is allocated for the operating system, and SP will be set correctly when your program starts. So how does it all work then? Well, we are able to put the contents of registers on to the stack using the move instruction. Have a look at this program:

```
move.l   #20,d0
move.l   d0,-(sp)
move.l   #50,d0
move.l   (sp)+,d0
rts
```

You'll see that we start by moving 20 into D0. Then we execute an instruction which will put the contents of D0 on to the stack. This introduces us to a new addressing mode, pre-decrement indirect is its name and, fortunately, it's easier to grasp than its name suggests. I introduced indirect addressing last month, looking a little like this...

```
move.w   (a0),d0
```

...which moves the word contents of the memory location pointed to by A0 to D0. By adding a minus sign in front of the first bracket we ensure that A0 is decremented (also by a word) *before* the memory is read. As you can imagine, if we kept repeating that instruction we'd first read a word, then the one before that, and so forth, effectively walking back through memory a word at a time. With our stack operation:

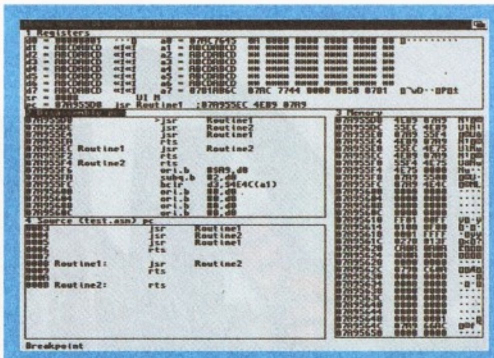
```
move.l   d0,-(sp)
```

Firstly the SP (or, indeed, A7) register is decremented by a long word (4 bytes, so 4 is subtracted from it) and then, in this case, d0 is written to the address pointed to by SP.

Now, back to our little program above. We then move the value 50 into D0, wiping out the 20 which was there before. Then we come to another stack operation:

```
move.l   (sp)+,d0
```

This is "post increment indirect". With this, the memory location is read first, and then the address register in brackets (in this case the stack pointer, A7) is incremented. So, as you can imagine, we'll read the 20 we just put on the stack straight back off. If we put several values on the stack, then they'd come off the top starting with the most recent.



This screenshot of DevPac in action shows both the assembler and machine code versions.

We can use this feature to our great advantage in programs. If we need to temporarily use a register which is currently in use, we can simply push it on to the stack, and pull it back when it's safe to do so. It's a very neat way of temporarily storing information. 68000 provides us with a great way of pushing to, or pulling from the stack many registers at once using the movem (Move Multiple) instruction.

```
movem.l  d0-d7/a0-a6,-(sp)
move.l       #1,d0
move.l       #2,d1
movem.l  (sp)+,d0-d1/a0-a6
rts
```

In this case we put all the registers to the stack (but obviously not the stack pointer itself), change the contents of a couple, and then pull the whole lot back in. You can use the movem instruction to put *any* combination of registers on the stack, or pull them back off. For example...

```
movem.l  d0-d1/d3/d6-d7/a5,-(sp)
```

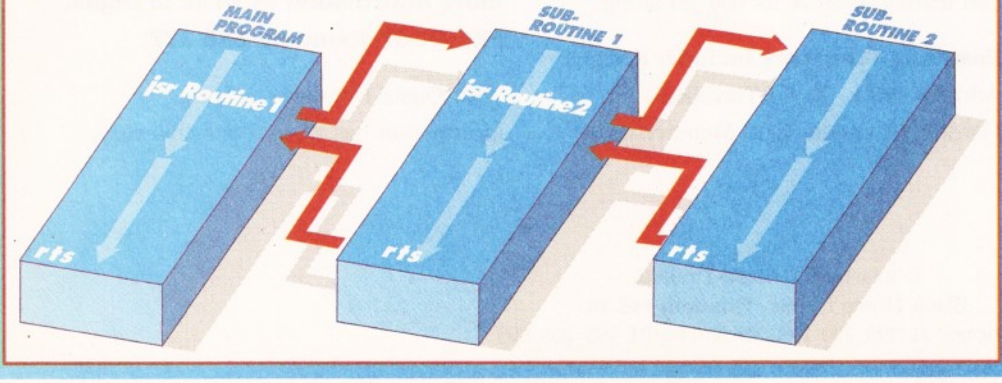
...which moves d0, d1, d3, d6, d7 and a5 on to the stack.

We will learn much more about stacks as we work our way through this course, but there are a couple of things to note about them at this point. The first is don't put information on the stack you don't need to. It's tempting, for example, to just put every register to the stack every time, rather than just the registers you need to – but this results in slower programs, as more information has to be moved around by the processor.

The second, and by far more important thing to note, is to *never* pull off the stack more or less than you put on there. If you put d0 and d1 on to the stack, make sure you take both of them back off again. They don't have to come back into the

SUBROUTINES

Subroutines can easily be called from within subroutines. However, make sure you leave the stack as you found it when exiting a routine...



same registers, but if two items go on, take two back off again. This is *very* important, because, as mentioned above, rts and jsr work by using the stack, which brings us back to subroutines.

RETURN TO SUBROUTINES

Back on subroutines, we said that the jsr instruction uses the stack so that the rts instruction knows where to come back to. Think back to our example of jsr above. When the first jsr instruction occurs, the processor pushes the address of the instruction immediately after the jsr (ie, the place to come back to) on to the stack as an address before jumping to the routine. The routine will then run, and eventually an rts instruction will be encountered.

Rts pulls the top value off the stack and jumps to it, which conveniently is the correct place to go. Now, just to frighten you a bit. With reference to the above little warning about stacks, you may already see what problems rts might get into if the value it pulled off the stack and jumped to was incorrect. Take this little program:

```
jsrA_Routine
rts
A_Routine:  movem.l  d0-d7,-(sp)
; lots of code here which does something☛
with d0-d7  movem.l  (sp)+,d0-d6
rts
```

Can you spot the unfortunate bug? In this case it could very easily have been a typing error, but we are putting d0 to d7 on to the stack, but only pulling d0-d6 back off. Rts now pulls a value off the stack and jumps to it, in this case it will be the old contents of d7, which could be anything. The result of this is normally a horrible crash, and your computer gurus. So be warned!

So what do we use routines for? In any complex program, there will be identical operations which need to be performed, with only minor differences, several times. In a computer game, for example, you might have lots of small graphic objects which need to be drawn at different points on the screen. This is the ideal opportunity for a subroutine. We could create a little program which put any of our graphic objects at any position on the screen. It might start like this:

```
; DrawASprite: On entry d0 is the X ☛
position in pixels, D1 is the Y position
; and A0 points to the graphic to be drawn.☛
No registers are corrupted.
; DrawASprite: movem.l  d2-d4/a5,-(sp)
; .... code to draw item ...
```

This is a subroutine which takes three parameters, or arguments. When we call it, using jsr, before the jsr instruction we put the X and Y position for the object in to d0 and d1, and then point a0 at the graphic. We then call the subroutine, which performs the work, and returns. Note we have documented at the start of the routine which registers are used, for what, and what registers are corrupted by this routine. In this case, none, as we put all the registers we are going to use on to the stack. As your programming skill improves, you'll begin to learn the right times to use sub-routines, and how to make them work best for you. Let's introduce another instruction:

```
bsr(Branch to Subroutine)
```

Uh, what? This is confusing. Another jsr. And what's more, it does exactly the same thing. Indeed, in our very first jsr example we could have replaced both JSRs with BSRs, and the program would have worked in exactly the same manner.

You will recall that last month we introduced a whole range of branch instructions, like:

```
BEQ(Branch if Zero flag is set)
```

They allowed us to go directly to other points in our program depending on whether certain conditions were met, or directly using the BRA instruction. Assemblers do a lot of work for you when converting your source code into real machine code, and this is something they do. All Branch instructions use an addressing mode called "Relative". When you say:

```
BRASomewhereInTheProgram
... the assembler generates the machine
code:
6000xxxx (In hexadecimal)
```

...where xxxx is a signed offset in bytes of where to go to relative to the current instruction location (the PC register). This next example:

```
Loop: braLoop
```

...is just a loop which will continue for ever. When assembled, the following code is produced:

```
6000FFFE
```

FFFE is the hex for -2. (you'll have to trust me on this, we'll deal with signed arithmetic in a future part of the course), and the 6000 is the machine code for the BRA instruction. So, it does pretty much the same thing – why would we use BSR over jsr? OK, here's an example to demonstrate one reason:

```
jsrRoutine
bsrRoutine
rts

Routine: rts
```

And when assembled, it generates the following code. I've arranged it in lines like the source code above to make it easier to follow:

```
4EB90001FD0C
61000004
4E75
4E75
```

Lordy. Well, it's obvious that the jsr version is a whole word (2 bytes) longer than the BSR. This is because BSR uses a signed word as an offset, whereas jsr stores the entire address of the routine we're going to. There is a catch, of course, because a signed word can only run from -32768 to +32767, which is 32K. This means that you can't use a branch instruction of any kind to jump anywhere that is more than 32K away from the branch instruction. Branch instructions can be one step cooler too, because if the area we're jumping is no more than 128 bytes away we can make it even smaller. If we replace the bsr in the above example with bsr.s:

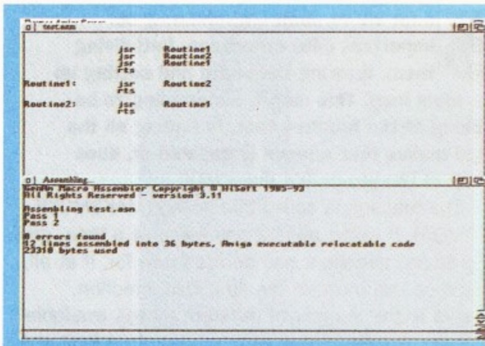
```
bsr.s Routine
```

We get the code:

```
6102
```

When you're writing programs with lots of little loops, and you are using branch instructions, it's worth trying to put the .s (for short) after them. If it is out of range after all, then the assembler will warn you and you can correct it. You might be thinking "If there is a jsr, surely there is j everything, like jeq working like beq, for example". This is not the case. There are only 2 j commands, jsr and jmp. Jmp acts just like BRA except it uses absolute addressing, just like jsr, and although...

```
jmpRoutine
```



This is the assembler equivalent of the illustration below, which shows how jsr works.

```
and
bra.s Routine
```

...are identical (as long as in the branch example the Routine is no more than 128 bytes away – as we're using .s), the jmp instruction is 6 bytes long, where as the branch is only 2. Using branches is efficient on space, you end up with smaller, faster and neater programs, and anything in this world which can make an assembly language program neater is a good thing (so don't skimp on documentation either!).

The other thing about branches is that they generate relocatable code. This means that the machine code programs generated can be loaded anywhere in memory and will work just fine. Programs using JMPs and JSRs however, contain fixed addresses which means that they will not work. On the Amiga, our operating system requires relocatable code, as when your program is loaded, it could be loaded anywhere.

But, as you've seen, we've used jsr and the programs have worked. This is because the Amiga sorts it all out for you once it's loaded the program, and before it runs it. We'll come back to this sort of thing again later in the course.

At the end of last month's issue, we wrote a small program to generate an average exam result. As I said then we could have written it a lot better. With the knowledge learned this month, we are able to reduce it into this:

```
    move.w    #$0000,d0
    move.w    #$0000,d1
    leaexam_results,a0

add_loop: move.w (a0)+,d2
    cmp.w #-1,d2
    beq.s got_them_all
    add.w d2,d0
    add.w #1,d1
    bra.s add_loop
got_them_all:  divu  d1,d0
    rts
    exam_results:  dc.w
20,80,56,87,45,98,23,32,79,-1
```

Which is a whole eight bytes smaller, and because we've improved the code which makes up the main loop itself, this whole program now operates considerably faster. In a couple of months we'll be able to knock another eight bytes off this as we introduce more new instructions.

Next month we'll be learning stacks of new instructions, leading on to the Amiga operating system and actually printing "Hello World" in a shell window! It's a lot of work to do this in Assembly Language – amazing really, considering the whole program in C is:

```
void main(void) { printf("Hello world\n");
}
```

But there's something to be said about the version we'll write in assembly language – it will be a 50th of the size, and a darn sight faster. AS

> **"As a programmer on the Amiga you don't have to worry about where in memory the stack is."**

Move on up

In this month's instalment of his chess programming masterclass, Cliff Ramshaw explains how your program can find all the legally available moves.

So far we've dealt with defining our important data structures, initialising them, drawing the board and setting up the main loop. This month we're going to be looking at the function that, in finding all the legal moves that a piece is capable of, does much of the program's main work.

The function is called findmove() (MAKEMOVE in AMOS). It works on just one piece at a time, and in only one direction, and decides how far, if at all, the piece can move in the specified direction. Thanks to the number of different moves available to chess pieces, this proves to be quite a long and involved bit of code.

Another part of the program that we haven't come to yet calls findmove() and passes it the type of piece to be checked, its position on the board in x and y coordinates, and the direction to check in. There are eight possible directions, numbered 0 to 7, with 0 representing north on a compass, 1 for north-east and so on. Take a look at the first diagram.

These directions can be broken down into x and y 'vectors' – which is to say, the number of squares that are to be moved along the x and y board directions. For instance, direction 3 (south-east) would have an x vector of +1 and a y vector of +1, while direction 7 (north-west) would have x and y vectors of -1.

For most pieces, these vectors will contain either -1, 0 or +1, since they move in diagonal, horizontal or vertical directions. Knights, though, with their 'L'-shaped moves, constitute a special case. For these, the direction numbers 0 to 7 correspond to the moves shown in the second diagram.

All of this information about the piece and its direction is stored in a structure of type move (defined last month) called foundmove. In AMOS, of course, there are no structures, so the array CURRENTMOVE is used instead. The values stored in this move structure are the result of findmove(). In the C version, it's no problem to return the whole lot, but you can't return an array from an AMOS procedure, so instead it has to be shared with the calling program.

The first thing findmove() does is to initialise the various parts of the structure. The table below shows how the structure elements correspond to the array elements in the AMOS version:

C	AMOS
foundmove	CURRENTMOVE
.x	0
.y	1
.dx	2
.dy	3
.distance	4
.score	5
.piece	7

The x and y elements are given the values of the function's x and y parameters. Similarly for the piece element. The score element is set to zero – it's used elsewhere and is of no concern to this function. The dx and dy elements – the direction vectors – are initialised to zero and will be altered once the program translates the rotation variable.

The final element, distance, is the one that determines how many squares in the specified direction the piece can move, and finding a value for this is the main aim of the function. It's initially set to zero, meaning that the function assumes it's dealing with an illegal move until it discovers otherwise.

The function now initialises the maxdist variable to 8, meaning that the piece can move as far as possible. If it's dealing with a knight, king or pawn that has already moved, then this will be set to 1, indicating that the piece can only move one square.

Next, the sign of the piece variable is reversed if it is negative. This is for convenience sake. It means we need just check for whether the piece is a pawn, for example, rather than checking if it's either a black or a white pawn.

The function now sees if it's dealing with a knight. If it is, then the dx and dy direction elements are set according to the value of rotation (see the second diagram). This is done in C by the switch statement, and by a series of If statements in AMOS. Once the direction vectors have been assigned, the variable maxdist is set to 1.

If the program's not dealing with a knight, then it chooses a different set of values for dx and dy depending on the value of rotation (see the first diagram).

DEALING WITH A KING

We next check to see if we're dealing with a king. If we are, then maxdist is again set to 1, to show that the piece can only move one square... unless it's castling, which is what the function checks for next.

First of all, the program ensures that the king is moving horizontally. It then checks that it's in its starting position. For this, x must be 4 and, if it's a white king, y must be 0, or 7 if it's a black king.

Next, the notmoved array (NMOVED in AMOS) is checked to ensure it contains a value of 1 for that position – ie, that the king has not already moved. The next part of the test depends on the direction the king is moving, so the following line sees if it's moving to the right.

If it is, and the following two squares are blank, and the right-hand corner rook hasn't yet moved, then it's possible to castle to the right and maxdist is set to 2.

Since we've already weeded out all but the horizontal directions, we know that if the king isn't moving right it must be moving left. To see if the king can castle left, we check that the three squares to the left are blank and that the left-hand rook hasn't moved. If so, a castle move is possible and maxdist is set to 3.

After all that, the function checks whether it's dealing with a rook and a diagonal move. If so, the function ends immediately and returns the structure foundmove with its distance element set to 0, indicating that the piece can't move in this direction. The program decides by taking the modulus (the remainder) of dividing rotation by 2. The result can be either 1 or 0. If it's 1, then we're dealing with an odd-numbered move. If you look at the first diagram, you'll see that all odd-numbered moves are diagonal ones.

Similarly, the function then checks to see if it's dealing with a bishop and a diagonal or horizontal move (an even-numbered rotation). If so, it ends.

A PIECE OF PAWN, PLEASE

What happens next depends on whether the piece is a pawn. Every other type of piece is handled in

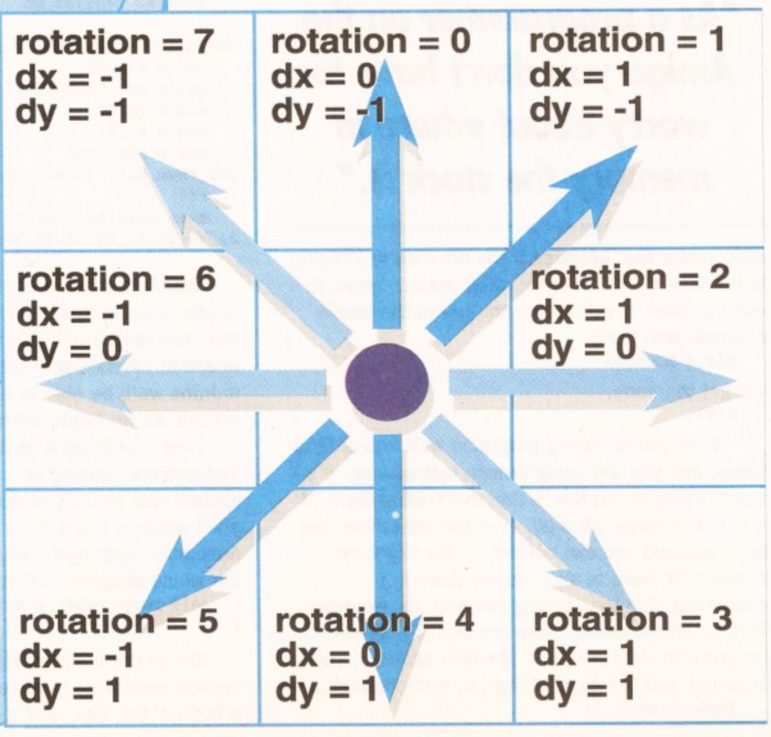


Diagram 1 – Most pieces can move in one of eight possible directions (represented by 0 to 7). Here's how the direction corresponds to movement on the board and the x and y vectors.

the same way.

First, a loop is entered. This loop continues so long as the distance element of foundmove (CURRENTMOVE) is less than maxdist, and so long as the move doesn't take the piece off the board. In the C version, dx is added to x and dy to y each time through the loop as the board's boundary conditions are checked. In AMOS, the additions are done on separate lines – once before the loop begins and again inside it.

Once inside the loop, the first test ensures the piece hasn't landed on another of its own side. We do this by multiplying together the values of the two pieces. Two white (positive) pieces together will produce a positive number, as will two black (negative) pieces. If it has moved on to one of its own pieces, then the function ends, returning foundmove. If this is the first time into the loop, foundmove's distance element will be zero – the piece can't move in this direction.

If the result isn't positive, it's possible to move a square in this direction so 1 is added to distance. If the piece is a king, then we immediately set distance to maxdist, which will be either 2 or 3 for a castling move, and return from the function. The king can only move one square or make a castling move, in which case further consideration is unnecessary because we've already checked the legality of a castling move.

Then we see whether the piece has taken an opponent's piece. Multiplying the two piece values together will yield a negative result in this case. If so, then we must return, because a piece can't keep moving after it's taken something.

Finally, the loop closes, and the process repeats, with further squares in the specified direction being checked.

Next we come to the special case of the pawns. First, the function tests if the dx and dy elements are going to take the piece off the board. If they are, then the function ends.

The next two if statements ensure that the pawn isn't moving backwards. If it is, again the function ends. We next check to see if the pawn is moving diagonally. If it is, then it must be taking a piece for the move to be valid. An if statement multiplies the piece value with the value in the board's destination square and checks that the result is negative. If so, it's a valid move and distance is set to 1. Either way, the function then ends.

We now know that the piece is moving vertically. The next thing to do is to check that it's moving on to a blank square. If it is, then distance is set to 1. If the pawn hasn't previously moved, then it has the option of moving two squares instead of one. The program looks for this case by seeing if it's dealing with a white pawn on the second row (y=1) or a black pawn on the seventh row (y=6). If so, and if the board is empty two squares from the pawn (calculated by adding twice dx and dy to x and y), then distance is set to 2, indicating that a two-square move is an option.

That's all the pawn possibilities dealt with – this program doesn't recognise the en passent move – and the end of the function as a whole.

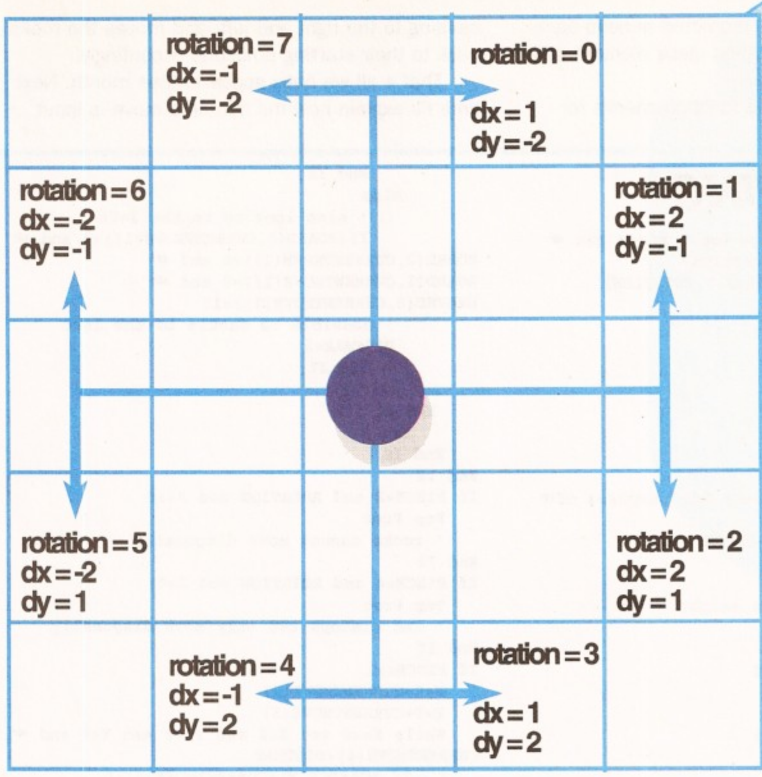


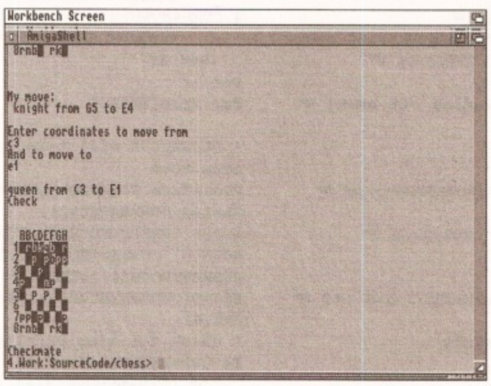
Diagram 2 – Knights are a special case. This shows their unique set of eight directional moves and the corresponding vectors.

You'll probably agree that, though conceptually it's easy to grasp, it's a fairly convoluted function. The many if statements are necessary to account for the wide variety of possible moves. With a game such as draughts or Connect-Four, the equivalent function would be much simpler.

ELEGANT FUNCTIONS

Let's round things off this month by taking a look at two functions that provide much more in the way of elegance.

You'll notice that none of the functions dealt with so far, with the exception of setupboard(), actually alter the board, although findmove() in particular makes frequent reference to it. The function that does alter the board is called makemove(). You pass it a move structure (or array in the case of AMOS) of the type created by findmove(), and it will alter the board array accordingly.



Got him at last! This is a game played at three-ply and with the check and checkmate testing code in place. With such a limited look-ahead, the program had failed to see the advantages of giving its king more freedom.

Obviously, this function is called whenever a move is made by the player or computer. Remember, though, that the computer tests every possible legal move and evaluates them. To do so, it needs to call makemove() in each case. Having obtained a score for a move, though, the program needs to take back the move so that it can test an alternative. This is done by the associated function erasemove() (BLANKMOVE in AMOS), which again takes a move structure as an argument.

The makemove() function returns a value – that of whatever used to be on the destination square. To this end, the variable taken is declared, and assigned the value of this square. The destination coordinates are found by multiplying dx by distance and adding the result to x; similarly, dy is multiplied by distance and added to y.

Next, the old board position – referenced by x and y – is zeroed, to indicate that it is now a blank square.

We next check to see if a pawn has moved to the far rank and needs promoting. This is the case if it's a white pawn in the eighth rank (y+distance*dy=7) or a black pawn in the first rank (y+distance*dy=0). If so, the piece is automatically promoted to a queen of the correct colour. Notice that in C the piece element can be altered directly. The structure has been passed as a parameter to makemove(), and so is local to it.

Any changes to its values made from within makemove() will not effect the original passed structure. This isn't possible in AMOS – the array CURRENTMOVE is shared and any changes to it will effect its values elsewhere in the program. Instead, the local variable PIECE is modified to a value of 5 or -5 (white or black queen).

This variable, or the piece element in C, is then stored in the destination square of the board array. Before finishing, though, the function first has to check for the case of castling and, if necessary, move a rook.

First of all, it sees whether it's dealing with a king. If it is, and the king's moving two places to the right, it's castling right. The program moves the rook to one place to the right of the king's old position and blanks the rook's old square.

If it's moving to the left with a distance of 3, then it's castling left. In this case, the left-hand rook is moved two places to the left of the king's old position and then its old square is blanked.

Finally, the function returns the value of taken, which will be non-zero if a piece has been taken.

As you might expect, erasemove() (BLANKMOVE) works in a similar way. It takes two parameters – a move structure and taken, the value of the piece, if any, that was taken in the move under consideration.

It puts the taken value in the move's destination square, and then puts the piece value in the move's starting square. Notice that this

automatically demotes any promoted queens back to pawns, since the unmodified piece element still holds the piece's old value.

Before wrapping up, the function checks for castling to the right and left, and moves the rooks back to their starting positions accordingly.

That's all we have space for this month. Next time I'll explain how the human's move is input and how findmove() can be used to check its legality, before going on to talk about the part of the program that actually decides which move is best. See you then. AS

AMOS LISTING

```
' findmove will find how far a piece can ☛
move in a specified direction
Procedure FINDMOVE[PIECE,X,Y,ROTATION]
Shared CURRENTMOVE()
CURRENTMOVE(0)=X
CURRENTMOVE(1)=Y
CURRENTMOVE(6)=PIECE
CURRENTMOVE(5)=0
CURRENTMOVE(4)=0
CURRENTMOVE(2)=0
CURRENTMOVE(3)=0
DISTMAX=8
' convert to a white piece for purposes of☛
calculation
If PIECE<0 Then PIECE=-PIECE

If PIECE=3
    ' special case for a knight
    If ROTATION=0
        CURRENTMOVE(2)=1
        CURRENTMOVE(3)=-2
    Else If ROTATION=1
        CURRENTMOVE(2)=2
        CURRENTMOVE(3)=-1
    Else If ROTAION=2
        CURRENTMOVE(2)=2
        CURRENTMOVE(3)=1
    Else If ROTATION=3
        CURRENTMOVE(2)=1
        CURRENTMOVE(3)=2
    Else If ROTATION=4
        CURRENTMOVE(2)=-1
        CURRENTMOVE(3)=2
    Else If ROTATION=5
        CURRENTMOVE(2)=-2
        CURRENTMOVE(3)=1
    Else If ROTATION=6
        CURRENTMOVE(2)=-2
        CURRENTMOVE(3)=-1
    Else If ROTATION=7
        CURRENTMOVE(2)=-1
        CURRENTMOVE(3)=-2
    End If
    DISTMAX=1
    ' knight can only move once
Else
    ' standard directions for pieces
    If ROTATION<=1 or ROTATION=7
        CURRENTMOVE(3)=-1
    End If
    If ROTATION>=1 and ROTATION<=3
        CURRENTMOVE(2)=1
    End If
    If ROTATION>=3 and ROTATION<=5
        CURRENTMOVE(3)=1
    End If
    If ROTATION>=5 and ROTATION<=7
        CURRENTMOVE(2)=-1
    End If
End If
If PIECE=6
    ' only one move for king
    DISTMAX=1
    ' check for possibility of castling
    If ROTATION=2 or ROTATION=6
        ' if we're looking at a horizontal ☛
move
        If(CURRENTMOVE(0)=4
and((CURRENTMOVE(1)=0 and CURRENTMOVE(6)=6)
or(CURRENTMOVE(1)=7 and CURRENTMOVE(6)=-6)))
        ' if we've found the king in its ☛
starting position

If(NMOVED(CURRENTMOVE(0),CURRENTMOVE(1))=1)
            'if it hasn't moved yet
            If ROTATION=2
                ' looking to the right
                If(BOARD(5,CURRENTMOVE(1))=0 and ☛
BOARD(6,CURRENTMOVE(1))=0 and ☛
NMOVED(7,CURRENTMOVE(1))=1)
                ' possible to castle to the right
                DISTMAX=2
                End If
            Else
                ' else looking to the left
                If(BOARD(3,CURRENTMOVE(1))=0 and ☛
BOARD(2,CURRENTMOVE(1))=0 and ☛
BOARD(1,CURRENTMOVE(1))=0 and ☛
NMOVED(0,CURRENTMOVE(1))=1)
                ' possible to castle to the left
                DISTMAX=3
                End If
            End If
        End If
        End If
    End If
End If
If PIECE=2 and ROTATION mod 2<>0
    Pop Proc
    ' rooks cannot move diagonally
End If
If PIECE=4 and ROTATION mod 2=0
    Pop Proc
    ' and bishops can only move diagonally
End If
If PIECE<>1
    X=X+CURRENTMOVE(2)
    Y=Y+CURRENTMOVE(3)
    While X>=0 and X<8 and Y>=0 and Y<8 and ☛
CURRENTMOVE(4)<DISTMAX
        If BOARD(X,Y)*CURRENTMOVE(6)>0
    ' landed on own piece
    Pop Proc
        End If
        CURRENTMOVE(4)=CURRENTMOVE(4)+1
        ' we can move in this direction
        If PIECE=6
    ' check for castling
    CURRENTMOVE(4)=DISTMAX
    Pop Proc
        End If
        If BOARD(X,Y)*CURRENTMOVE(6)<0
    ' taken an opponent's piece
    Pop Proc
    ' then can move no further
        End If
        ' otherwise continue searching in ☛
direction for as long as possible
        X=X+CURRENTMOVE(2)
        Y=Y+CURRENTMOVE(3)
    Wend
Else
    If X+CURRENTMOVE(2)<0 or ☛
X+CURRENTMOVE(2)>7 or Y+CURRENTMOVE(3)<0 or☛
Y+CURRENTMOVE(3)>7 or ROTATION=2 or ☛
ROTATION=6
        ' move invalid if heading off board ☛
or horizontally
        Pop Proc
    End If
    If CURRENTMOVE(6)=1 and(ROTATION<3 or ☛
ROTATION>5)
        ' invalid if moving backwards ☛
        Pop Proc
    End If
    If CURRENTMOVE(6)=-1 and(ROTATION>1 and ☛
ROTATION<7)
        ' again moving backwards
        Pop Proc
    End If
    If ROTATION<>0 and ROTATION<>4
        ' moving diagonally
        If
BOARD(X+CURRENTMOVE(2),Y+CURRENTMOVE(3))*☛
CURRENTMOVE(6)<0
    ' taken a piece
    CURRENTMOVE(4)=1
    ' it's valid
        End If
        Pop Proc
    End If
    If
BOARD(X+CURRENTMOVE(2),Y+CURRENTMOVE(3))=0 ☛
        CURRENTMOVE(4)=1
        ' if no piece in the way, the move ☛
is valid
        If((CURRENTMOVE(6)=1 and Y=1)☛
or(CURRENTMOVE(6)=-1 and Y=6))
        ' pawn not yet moved
        If ☛
BOARD(X+2*CURRENTMOVE(2),Y+2*CURRENTMOVE(3))☛
=0
            CURRENTMOVE(4)=2
        End If
            End If
        End If
End If
End Proc


' given a valid move structure in
CURRENTMOVE, MAKEMOVE will alter the board ☛
accordingly
' returns the piece previously occupying ☛
the square moved to
Procedure MAKEMOVE
Shared CURRENTMOVE()
PIECE=CURRENTMOVE(6)
TAKEN=BOARD(CURRENTMOVE(0)+CURRENTMOVE(2)*☛
CURRENTMOVE(4),CURRENTMOVE(1)+CURRENTMOVE(3)☛
*CURRENTMOVE(4))
BOARD(CURRENTMOVE(0),CURRENTMOVE(1))=0
If CURRENTMOVE(6)=1 and
CURRENTMOVE(1)+CURRENTMOVE(3)*CURRENTMOVE(4)☛
=7
    PIECE=5
    ' promotion to a queen
End If
If CURRENTMOVE(6)=-1 and
CURRENTMOVE(1)+CURRENTMOVE(3)*CURRENTMOVE(4)☛
=0
    PIECE=-5
    ' promotion to a black queen
End If
BOARD(CURRENTMOVE(0)+CURRENTMOVE(2)*CURRENTMO
VE(4),CURRENTMOVE(1)+CURRENTMOVE(3)*CURRENTMO
VE(4))=PIECE
If PIECE=6 or PIECE=-6
    If CURRENTMOVE(2)=1 and CURRENTMOVE(4)=2
        ' castled to the right

BOARD(CURRENTMOVE(0)+1,CURRENTMOVE(1))=BOARD☛
(7,CURRENTMOVE(1))
        BOARD(7,CURRENTMOVE(1))=0
    End If
    If CURRENTMOVE(2)=-1 and CURRENTMOVE(4)=3
        ' castled to the left
        BOARD(CURRENTMOVE(0)-☛
2,CURRENTMOVE(1))=BOARD(0,CURRENTMOVE(1))
        BOARD(0,CURRENTMOVE(1))=0
    End If
End If
End Proc[TAKEN]

' BLANKMOVE will take back a previously ☛
made move
Procedure BLANKMOVE[TAKEN]
Shared CURRENTMOVE()
BOARD(CURRENTMOVE(0)+CURRENTMOVE(2)*CURRENT☛
MOVE(4),CURRENTMOVE(1)+CURRENTMOVE(3)*☛
CURRENTMOVE(4))=TAKEN
BOARD(CURRENTMOVE(0),CURRENTMOVE(1))=CURRENTM
OVE(6)
' check for king castling
If CURRENTMOVE(6)=6 or CURRENTMOVE(6)=-6
    If CURRENTMOVE(2)=1 and CURRENTMOVE(4)=2
        ' castled to the right

BOARD(7,CURRENTMOVE(1))=BOARD(CURRENTMOVE(0)☛
+1,CURRENTMOVE(1))

BOARD(CURRENTMOVE(0)+1,CURRENTMOVE(1))=0
    End If
    If CURRENTMOVE(2)=-1 and CURRENTMOVE(4)=3
        ' castled to the left

BOARD(0,CURRENTMOVE(1))=BOARD(CURRENTMOVE(0)☛
-2,CURRENTMOVE(1))
        BOARD(CURRENTMOVE(0)-
2,CURRENTMOVE(1))=0
    End If
End If
End Proc
```

C LISTING

```
/* find how far a piece can move in a ☛
specified direction */
struct move findmove(int piece, int x, int ☛
y,int rotation)
{
     struct move foundmove;

     /* initialise the move's structure */
     foundmove.x=x;
     foundmove.y=y;
     foundmove.piece=piece;
     foundmove.score=0;
     foundmove.distance=0;
     foundmove.dx=0;
     foundmove.dy=0;

     int maxdist=8;


     if (piece<0) piece=-piece; /* convert ☛
to white piece for purposes of calculation */

     if (piece==3) {
    /* special case for knight */
    switch (rotation) {
       case 0:
      foundmove.dx=1;
      foundmove.dy=-2;

      break;
       case 1:
      foundmove.dx=2;
      foundmove.dy=-1;

      break;
       case 2:
      foundmove.dx=2;
      foundmove.dy=1;

      break;
       case 3:
      foundmove.dx=1;
      foundmove.dy=2;

      break;
       case 4:
      foundmove.dx=-1;
      foundmove.dy=2;

      break;
       case 5:
      foundmove.dx=-2;
      foundmove.dy=1;

      break;
       case 6:
      foundmove.dx=-2;
      foundmove.dy=-1;

      break;
       case 7:
      foundmove.dx=-1;
      foundmove.dy=-2;

      break;
       default:

      break;
    }
    maxdist=1; /* knight can only move once */
     }
     else {


    /* standard directions for pieces */
    if (rotation<=1 || rotation==7)
foundmove.dy=-1;
    if (rotation>=1 && rotation<=3)
foundmove.dx=1;
    if (rotation>=3 && rotation<=5)
foundmove.dy=1;
    if (rotation>=5 && rotation<=7)
foundmove.dx=-1;
     }
     if (piece==6) {
    maxdist=1; /* only one move if king */
    /* check for possibility of castling */
    if (rotation==2 || rotation==6) { /* if ☛
we're looking at a horizontal move */
          if (foundmove.x==4 && ((foundmove.y☛
==0 && foundmove.piece==6) || (foundmove.y☛
==7 && foundmove.piece==-6))) {
         /* if we've found the king in its☛
starting position */
          if
(notmoved[foundmove.x][foundmove.y]==1) { /*☛
if it hasn't moved yet */
            if (rotation==2) {
         /* looking to the right */
           if (board[5][foundmove.y]==0 && ☛
board[6][foundmove.y]==0 &&
notmoved[7][foundmove.y]==1) {
                /* possible to castle to the ☛
right */
                maxdist=2;
              }
            }
            /* looking to the left */
            else {
           if (board[3][foundmove.y]==0 && ☛
board[2][foundmove.y]==0 &&
board[1][foundmove.y]==0 &&
notmoved[0][foundmove.y]==1) {
                /* possible to castle to the ☛
left */
                maxdist=3;;
              }
            }
         }
       }
     }
    }
     if (piece==2 && rotation%2!=0)

    return foundmove; /* rooks cannot move ☛
diagonally */
     if (piece==4 && rotation%2==0)
    return foundmove; /* and bishops can ☛
only  move diagonally */

     if (piece!=1) {

    while ((x=x+foundmove.dx)>=0 && x<8 && ☛
(y=y+foundmove.dy)>=0 && y<8 && ☛
foundmove.distance<maxdist) {


          if (board[x][y]*foundmove.piece>0) ☛
/*  landed on own piece */
        return foundmove;
          foundmove.distance++; /* we can ☛
move in this direction */
          if (piece==6) { /* check for ☛
castling  */
         foundmove.distance=maxdist;
         return foundmove;
          }

          if (board[x][y]*foundmove.piece<0) ☛
/* taken an opponent's piece */
        return foundmove; /* then can move no☛
further */
    } /* otherwise continue searching in ☛
direction for as long as possible */


     }

      else {
    if (x+foundmove.dx<0 || x+foundmove.dx>7☛
|| y+foundmove.dy<0 || y+foundmove.dy>7 || ☛
rotation==2 || rotation==6)
    /* move invalid if heading off board or ☛
horizontally */
         return foundmove;
    if (foundmove.piece==1 && (rotation<3 || 
☛ rotation>5))
    /* invalid if moving backwards */
         return foundmove;
    if (foundmove.piece==-1 && (rotation>1 ☛
&&  rotation<7))
    /* again moving backwards */
         return foundmove;
    if (rotation!=0 && rotation !=4) { /* ☛
moving diagonally */
          if
(board[x+foundmove.dx][y+foundmove.dy]*☛
foundmove.piece<0) /* taken a piece */
        foundmove.distance=1; /* it's valid */
         return foundmove;
    }
    if
(board[x+foundmove.dx][y+foundmove.dy]==0) {
      foundmove.distance=1; /* if no ☛
piece  in the way, the move is valid */
      if ((foundmove.piece==1 && y==1) || ☛
(foundmove.piece==-1 && y==6))
        /* pawn not yet moved */
         if
(board[x+2*foundmove.dx][y+2*foundmove.dy]☛
==0)
          foundmove.distance=2;
     }
    }
    return foundmove;
}

/* given a valid move structure, makemove ☛
will alter the board accordingly */
/* returns the piece previously occupying ☛
the  square moved to */
int makemove(struct move trymove)
{
    int taken;


taken=board[trymove.x+trymove.dx*trymove.☛
distance][trymove.y+trymove.dy*trymove.☛
distance];
    board[trymove.x][trymove.y]=0;
    if (trymove.piece==1 &&
(trymove.y+trymove.dy*trymove.distance==7))
   trymove.piece=5; /* promotion to queen */
    if (trymove.piece==-1 &&
(trymove.y+trymove.dy*trymove.distance==0))
   trymove.piece=-5; /* promotion to black
queen */


board[trymove.x+trymove.dx*trymove.distance]☛
[trymove.y+trymove.dy*trymove.distance]=☛
trymove.piece;
    if (trymove.piece==6 || trymove.piece☛
==-6) {
   if (trymove.dx==1 && trymove.distance==2)
{
      /* castled to the right */

board[trymove.x+1][trymove.y]=board[7]☛
[trymove.y];
      board[7][trymove.y]=0;
   }
   if (trymove.dx==-1 && trymove.distance==3)
{
      /* castled to the left */
      board[trymove.x-
2][trymove.y]=board[0][trymove.y];
      board[0][trymove.y]=0;
   }
  }
    return taken;
}

/* erase - take back a previous move */
void erasemove(struct move trymove, int ☛
taken)
{
board[trymove.x+trymove.dx*trymove.distance]☛
[trymove.y+trymove.dy*trymove.distance]=taken
;
board[trymove.x][trymove.y]=trymove.piece;

    /* check for king castling */
  if (trymove.piece==6 || trymove.piece☛
==-6) {
   if (trymove.dx==1 && trymove.distance==2)
{
      /* castled to the right */
   board[7][trymove.y]=board[trymove.x+1]☛
[trymove.y];

      board[trymove.x+1][trymove.y]=0;
   }
   if (trymove.dx==-1 && trymove.distance==3)
{
      /* castled to the left */
      board[0][trymove.y]=board[trymove.x-
2][trymove.y];
      board[trymove.x-2][trymove.y]=0;
   }
    }
}
```

MUD-WRESTLING in Cyberia

"You haven't lived until you've died in MUD." No, our celebrity comms correspondent, Davey Winder, hasn't gone totally teapot, but he has been sent to Cyberia.

This month Wavey Davey takes a look at how you can use the Internet even if you don't have a modem, a telephone, or any idea of what you are doing! He's also had a coffee in Cyberia, and a mudpack in Dragon Land. Read on and find out what he thought of it.

INTERNET AND CHIPS

What with the amazing amount of media coverage the Internet has been getting of late, and I am as guilty as anyone for helping this along I'm pleased to say, I dare say you might be interested in taking a look for yourself. Am I right? But hold on a minute, what if it isn't for you, that modem, the Internet account, the books by Wavey they will all have cost you a pretty penny and for what? Well fear not, for now it is possible to dip your toes in the waters of Cyberspace without investing in any hardware, without committing yourself to an Internet account for ten pounds a month, without even having to use your own phone. All you need to do to become a part time net surfer is to pop along to a small cafe just off of London's Tottenham Court Road.

Cyberia is the first example of a "Cybercafe" to open in the UK, although similar establishments have long been a popular attraction in the San Francisco Bay area of the United States. The idea is that you have a friendly cafe where you can find the Internet on the menu alongside the coffee and cheesecake. Cyberia is the brainchild of Eva Pascoe and Gene Teare, and it opened for business at the end of September.

Situated at 39 Whitfield Street, which is right behind Goodge Street tube station, Cyberia is a small sparsely decorated and furnished (as is the fashion it seems these days) cafe. Along one wall is a bank of PCs, yes I'm afraid there are no Amigas there, all connected to the Internet and ready to use. Accessing the Internet is made very easy by the use of a menu front end designed by EasyNet, partners in Cybercafe and Internet service providers. When I was there all the computers were being used, and most people seemed to be either sending email or using the World Wide Web.

One guy, a professional backgammon player, comes in every single day to connect to a backgammon server on the Internet and plays against top class players the world over. You can't, of course, just walk in and use the computers for free, otherwise Cyberia would go out of business very quickly indeed and I would spend my entire life there. Having said that, they do provide a very cost effective means of taking a look at the Net. Currently it costs £2.50 for 30 minutes connected to the Internet, and if you need any help there are plenty of experienced staff who will give you basic tuition at no extra charge. One couple, who had never connected to the Internet before, walked in while I was there and within 10 minutes of starting (with a little help from the cafe staff) were quite happily wandering around the World Wide Web.

> "One guy, a professional backgammon player, comes in every day to connect to a backgammon server on the Internet and plays against top class players the world over."

Now all this may sound just a little, teensy weensy, tad anorakish. Well that's what I thought to be honest. I mean, who wants to go and drink a cup of coffee in the company of a load of spotty trainspotters yakking on about encryption techniques and TCP/IP protocols? In reality, there was little evidence that this was the case. During my visit there was a refreshing mixture of people using the cafe, some just drinking the coffee, others just surfing the Net, many doing both.

I saw men in smart business suits, students, a gentleman of advancing years (I'm far too polite to say a doddery old git), in fact exactly the cross section of society you would find in any London cafe during a Tuesday afternoon. My only problem was with the layout of the cafe, as the PCs were all banked along one wall rather than spread around the tables. This has the effect of separating coffee drinkers from net surfers, and led to a slightly "public library" feel to the place, but this is just a small whinge set against a veritable ocean of compliments!

Would you like some Internet with your coffee, Sir?

Plans are underfoot to establish more of these cybercafes, with Birmingham, Leeds, Manchester, Edinburgh, and Glasgow targeted as likely areas. Providing they continue to serve coffee and cheesecake of the same standard as Cyberia I shall have no complaints to make.

Name: *Cyberia*
Location: *39 Whitfield Street, London W1*
Open: *Mon to Sat 10am to 6pm (10pm Tues and Thurs)*
Costs: *Internet access £2.50 per 30 minutes*

***Wavey's Verdict:* Worth a visit, especially if you want to see just what the Internet has to offer before splashing out on the necessary equipment.**

NET NEWS

A new Internet Service Provider has appeared on the scene, offering full blown Internet access at a reasonable price. Easynet are the people who provide the Internet access for Cyberia, and customer support is actually available from staff members in the cafe. Unfortunately Easynet, like so many others, appear to have totally ignored Amiga users when it comes to software. All their advertising material makes a great point about the fact that they offer easy access to the Internet by way of their front end graphical menus, but this is only if you happen to be a Windows or Mac user!

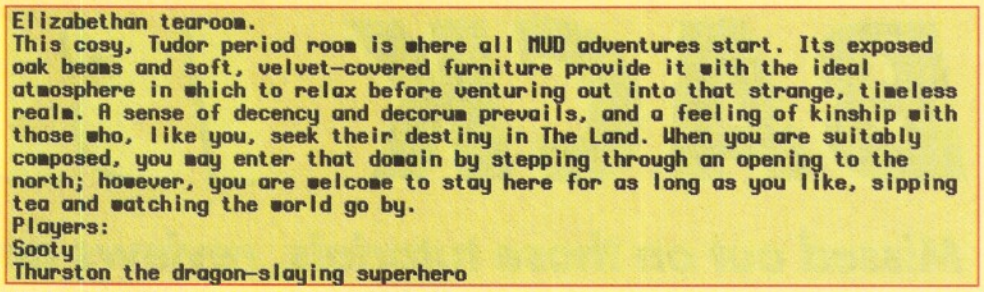
Can the internet ever be easy? see 'net news'

I spoke to David Rowe, one of Easynet's three partners, and asked him why this should be so. Apparently, it is simply because nobody connected with Easynet knows anything about Amigas. You can, of course, still use their service as your Internet gateway and make use of the very good Amiga software that is freely available around the Net, you just won't get the customised front end that makes Easynet so easy to use. If you would like to see the Amiga supported by this company, or reckon you could be the person to help them provide such access, then contact Easynet at the address given.

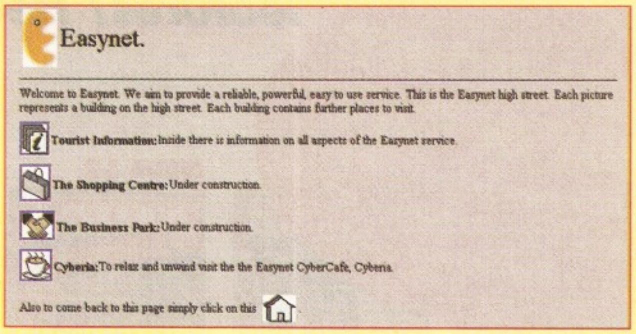
Currently Easynet can only offer access via its London telephone number, but there are plans to set up Points of Presence at cybercafes around the UK. Watch this space, as they (whoever they may be) say.

Name: *Easynet*
Address: *39 Whitfield Street, London W1P 5RE*
Phone: *071 209 0990*
Email: *admin@easynet.co.uk*
Costs: *Initial registration £25, then access from £9.90 per month (+VAT)*

Wavey's Verdict: ***A good service, plenty of customer support, but nothing Amiga specific. If you want to use your Amiga for the Internet you may do better to look at Demon who have Amiga software available, and offer Amiga technical support***



Wavey couldn't resist popping into a tearoom, in this case an Elizabethan one at the start of the MUD2 quest.



You can reach Cyberia and Easynet on the World WideWeb at http://www.easynet.co.uk/ HOME.HTM

MUD, GLORIOUS MUD!

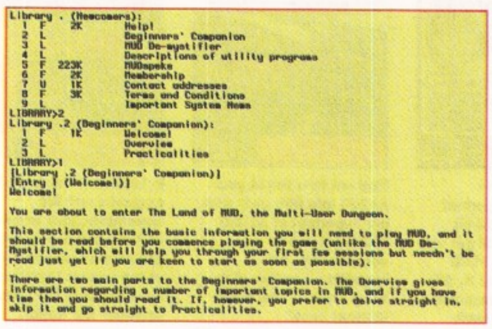
I got a letter recently from Roger Harazim who runs "The Dragon System", the official home of MUD2. Roger was concerned that there appears to be so much coverage of the Internet in magazines of late, that semi-commercial and free BBSs are in danger of being ignored. Well, not so here at *Amiga Shopper* where we will continue to cover every aspect of comms. If you run a BBS then write to Wavey and tell me about it, I'll gladly give some page space to any deserving system!

Now, back to Roger and all that MUD. It all started off back in 1979 at Essex University when Roy Trubshaw wrote his own version of the classic "Collosal Cave" text adventure. The difference being that several players could take part at the same time. He called it Multi-User Dungeon, or MUD for short. When Roy left University the game was developed further by Richard Bartle, and it became known as MUD1 (damn fiendish these University types) and was made available to people not at the University by means of comms.

Guess who the first Wizard to arrive from the outside world was? None other than Jez San, author of Starglider, one time Amiga guru and an ex co-moderator of mine in the Amiga conference on Cix. MUD continued to develop, a company called MUSE was formed to market the game, and soon it found its way onto the CompuNet system (a long gone commercial on-line system). Eventually British Telecom became involved and a re-write of MUD, called MUD2, was undertaken which was hoped to find its way onto BT's Prestel system. Unfortunately this didn't happen, they chose to use a game called Shades instead.

> **"MUD2 is best described as being text-based Virtual Reality – you really do get absorbed by it all."**

To cut a long story short [Thank goodness for that – *Ed*] Prestel eventually decided to shelve the "leisure" side of its operation and Shades closed down. MUD1 continues to enjoy popularity thanks to its presence on CompuServe, but at a cost that is prohibitive to most dedicated players. So where does this leave MUD2 and where does Roger Harazim fit into the picture? Well Roger acquired the run-time license for MUD2 and set up a company called The Wizards' Guild Ltd to operate the game.



There's plenty of on-line help if you have never played a MUD before.

This had some success, but was one of the recessions many casualties. However, all was not lost as Roger now runs The Dragon System, a BBS dedicated to providing MUD for the masses, and I've been taking my virtual life in my hands to have a look.

The Dragon System is where the dedicated MUD2 players can be found, more than 200 of them at the time of writing. If Roger has anything to do with it then this figure will be growing rapidly over the next few months. When we spoke he was talking of an offer of International Sponsorship which will enable MUD2 to be accessed from the Internet (via telnet), as well as local access points all over the UK and beyond, rather than just the Essex number that exists at the moment.

Why all this excitement over a text game, do I hear you saying? Well, for one thing text adventure games, especially the on-line variations, are terribly addictive. Far more so, in my opinion, than most games that we are offered in today's graphical marketplace.

The game-play and interaction are everything, the game itself is constantly changing with new adventurers joining, old ones being killed, new challenges and quests, new dangers to avoid and new treasures to discover. MUD2 is best described as being text based Virtual Reality – you really do get absorbed by it all.

I particularly like the locations that are described so evocatively in MUD2, the depth of atmosphere is really quite startling. I like to think of it in the same way as I do a book, I often find that I am disappointed with the film version of a book as it doesn't match what I conjure up in my minds eye. MUD2 is like a book, whereas most games today are like the movies, lots of gloss and hype but very little actual depth.

Now for the big question, the one of cost. We have all heard of scare stories of people going bankrupt or having their testicles removed by the mafia because of the debts they have gained through playing an on-line adventure game. Actually, I haven't but it looked good when I was writing this. The Dragon System is for people who like to play MUD, and is run by people who like to play MUD, therefore the prime objective isn't to make loads of money.

If you are just starting out and not sure how hooked you may get, you can pay by the hour at a rate of 1.50 with a minimum of 10 hours purchasable at a time. For the more serious and addicted players, there are two options which give unlimited access at very reasonable rates, three months access for £30 or six months for £50. Credits are always paid for in advance, so there is no danger of being caught out by a big bill (unless it is from British Telecom of course!). As an additional bonus, members also receive the regular MUD newsletter "Hawumph!" which makes for interesting reading.

Name: ***The Dragon System***
Address: ***"Drachen Fels", 2 Mayfair Avenue, Basildon, Essex, SS13 1QG***
Phone (voice): ***0268 728889***
Phone (modem): ***0268 724440***

Wavey's Verdict: ***Try it – I think you may become addicted!*** AS

CONNECTING TO THE DRAGON SYSTEM

1) Set your terminal preferences to 8,N,1
2) Set your modem speed to 2400
3) Connect to 0268 724440
4) On connection, at the login prompt, type "mudguest"
5) When prompted for a password type "new"

You will now have guest status on the system, this will let you play MUD2 for about 20 minutes and take a look at the system. If you want to continue playing, and you most likely will, then you have to become a member. All the information you need can be found on-line so I won't waste time wibbling on about it here!

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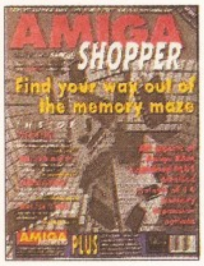
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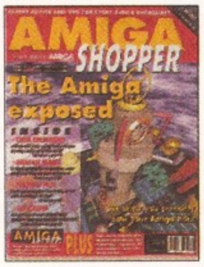
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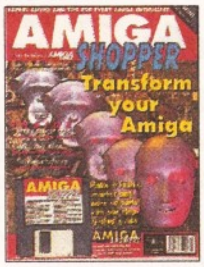
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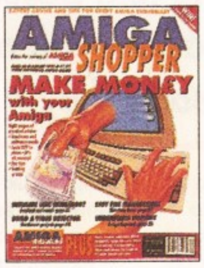
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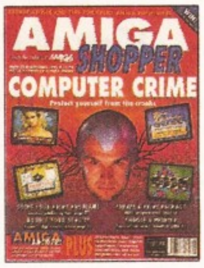
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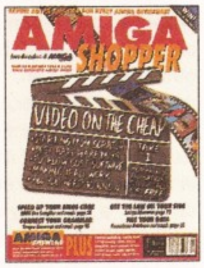
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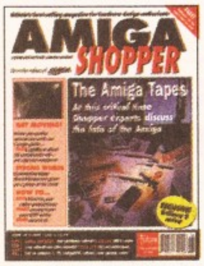
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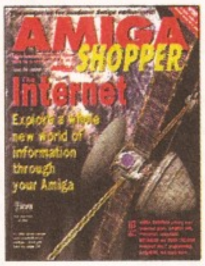
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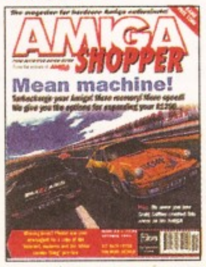
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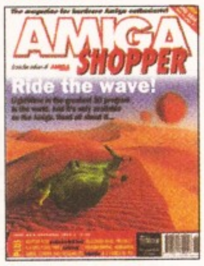
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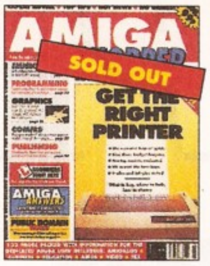
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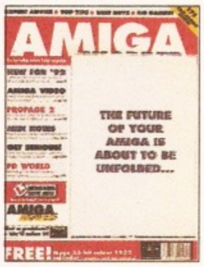
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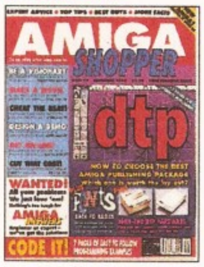
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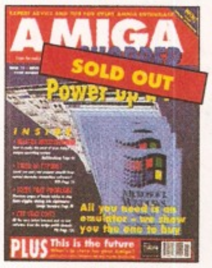
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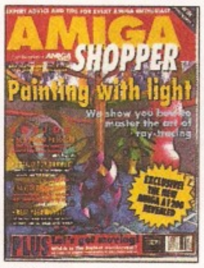
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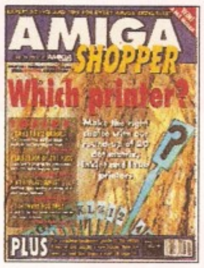
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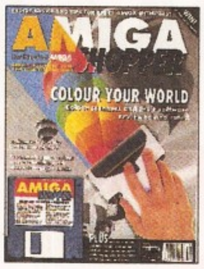
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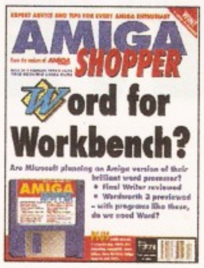
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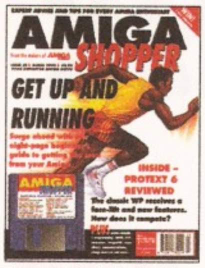
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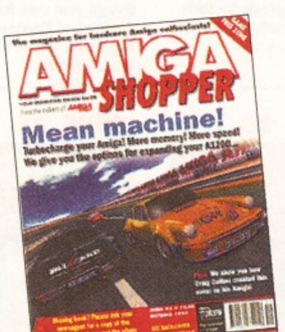
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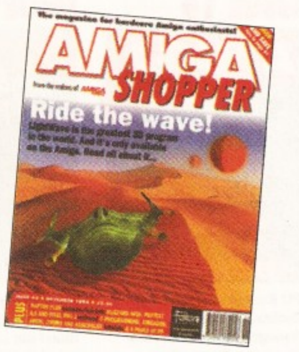
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Musical Playmate

Get more notes out of your Amiga. Tim Tucker explains how the Amiga can be pushed to give you a full scale orchestral performance of Beethovenian proportions.

One of the main things that stops many people getting involved in using their Amiga to make music is that they don't believe it's up to the task. Many say that it's fine for knocking out a quick tune, or a dance track, but when it comes to serious musical composition, and full orchestral arrangements, the Amiga is left far behind. This is of course entirely untrue, and so this month we're going to take a look at how the Amiga can be pushed to give us a full scale orchestral performance of Beethovenian proportions.

Before we start, let's define which aspect of the Amiga's sound we are looking to expand. There are two main criteria for expanding orchestration, and they're both called "Polyphony". Firstly, polyphony in the musical equipment sense, which simply means more than one note of music coming from the equipment at a time. Thus an eight note polyphonic synth could play eight notes at a time.

This is fine for expanding the number of notes, but it's no good if they're all the same sound – 56 different notes on one piano will not an orchestration make. We also need to be able to play polyphonically in the musical sense of "the multiplication of sounds", in other words, play a number of sounds at once, on different instruments. Quite a task, but the road is not as long or complicated as you may think.

> "MIDI's great. MIDI's wonderful. In fact, if it weren't for MIDI the idea of using computers for music would almost certainly have got stuck in a rut."

When making music on the Amiga, it's certainly true that many users take advantage of only a fraction of its full potential. This is because the entry point for making noises on the Amiga is through its internal sound chip. Indeed this is one of the Amiga's strengths, because it has such relatively powerful sonic capabilities that are easy to access, and you can actually create good music on the Amiga with very little extra outlay.

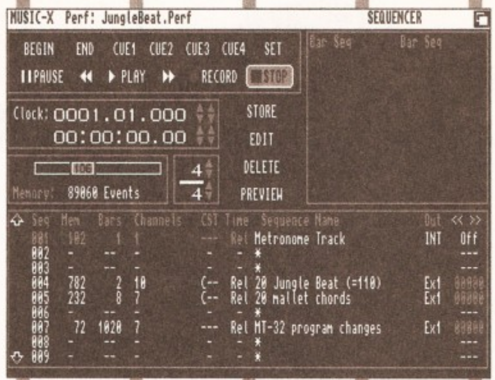
What are these capabilities? Well, the Amiga can produce 4 channels of sound, which simply means that it can play four different sounds at the same time. To use our new found vocabulary, it has 4-note polyphony. This is very powerful in itself, as most sound reproduction equipment, such as your home hi-fi, is only capable of two channel sound (left and right in a stereo set-up). Therefore, if you're using the Amiga's internal sound to create stand alone music, a soundtrack for animation and desktop video, or any other presentations that can be produced on the Amiga itself, you can use two channels of sound for the music, and the other two channels for sound effects, speech samples, and other audio delights. In this situation, the Amiga can plausibly accommodate your needs all by itself.

The above scenario is extremely convenient when using your Amiga to create multi-media masterpieces, and is often the ideal solution, as all the elements of the presentation are coming from one source – your Amiga. And it's not necessarily true that the quality of the sound is not up to it – I've used the Amiga's internal sound to produce jingles for broadcast on television, along with all the necessary sound effects, and totally in sync with animations produced using Deluxe Paint. It can work, and it can work well.

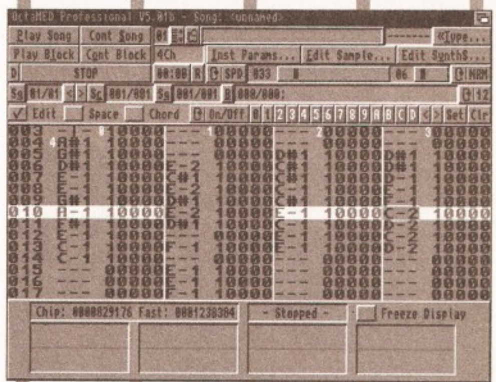
The real problem with using the Amiga this way is the age old frustration that any hi-tech musician faces, and that is of course the inherent limitations of the system. It may be true that Sergeant Peppers Lonely Hearts Club Band was recorded on a four track tape machine back in the late sixties, but these days musicians demand a lot more from their technology, and we always feel that we need those extra few tracks that we don't have.

In the case of the Amiga, remember, we're not restricted to four tracks, but four channels of sound, and there's a big difference. A track on a tape recorder could contain a whole band or orchestra if you wanted, whereas if you're sequencing internal sounds, a channel on the Amiga plays only one note of one instrument at a time. Thus four channels equals at most four different piano notes simultaneously, or perhaps a bass, trumpet, kick drum and snare. Not very musically ambitious, is it?

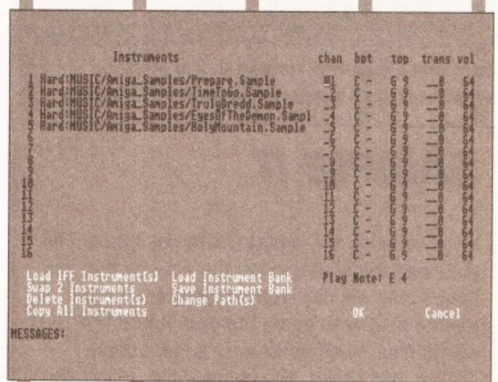
There are a number of ways round this, ranging from the "cheap but corner cutting" to the "buying expensive extra hardware" option. You can, for instance, treat your Amiga as a digital recording device, and use each channel as if it



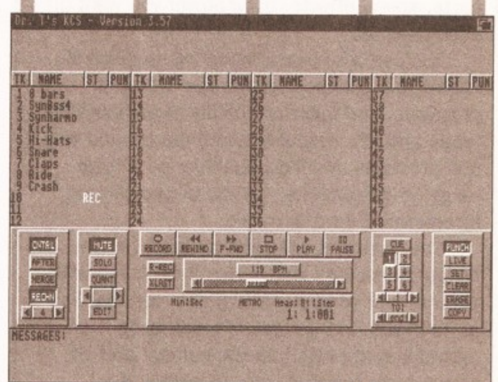
Music-X is great, because it lets you assign tracks to more than one MIDI output. Power!



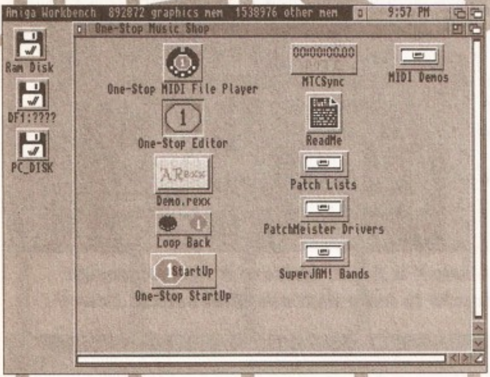
OctaMED gives you the most you're going to get out of your Amiga alone, eight channels of sound.



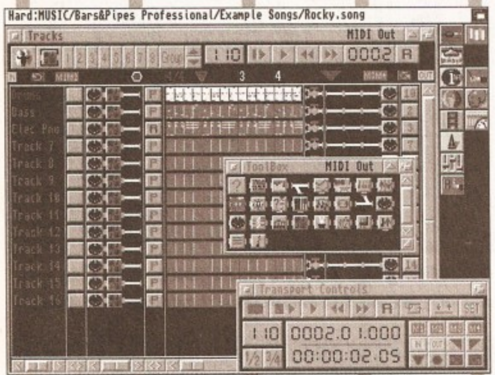
Many sequencers, including Dr T's KCS, can play Amiga samples along with MIDI tracks.



To record MIDI on your Amiga you'll need a sequencer, like this. 48 tracks should do you fine.



The One Stop Music Shop, a multi-timbral synth that fits in your Amiga, with software control.



Bars and Pipes Pro version 2.5 is another sequencer that supports multiple MIDI outs.

SAMPLE IT

If you're using the Amiga's internal sound chip, you need to come up with the sounds that the sound chip will use from somewhere. Often, tracker programs come bundled with a few sound files, such as drums, guitar notes, pianos, and brass. You choose one sound per channel, and create melodies, counter melodies, harmonies, baselines, percussion parts, sound effects, or whatever you want on each channel.

You can also use a sampling program to record your own sounds for use in tracker programs, and there are plenty of sample CDs, tapes and LPs available which are packed with one off notes and individual hits on a huge range of instruments, for you to sample and incorporate into your music.

The cost of a sampling package for the Amiga starts very low, under ·£·50 if you shop around, and consists of a simple combination of hardware, in the form of a sampling cartridge that plugs into the parallel port of your Amiga, and software, to control the recording and playing back of sample sounds. If you want to make the most of the Amiga's internal sound and tracker software, it's essential you get hold of a good sampling system. All the sounds that you sample can be saved in the Amiga's standard IFF sample sound format, and can be loaded into all tracker programs, and even many MIDI sequencers (which we'll get to later).

were a track on a multi-track recorder. You take a piece of fully orchestrated music, either your own music recorded in a studio, or a suitable piece of music from your LP, tape or CD collection. Sample the entire soundtrack in stereo on your Amiga, and you've got the same stereo recording, but now stored digitally in the Amiga, ready to play back at any time. This only takes up two channels of course, which leaves the other two free for your sound effects, or whatever.

While this option can be extremely effective it does have its problems. Not least of these is the amount of memory that such a sample requires. If the piece of music you want to record is quite long, even just two minutes, you could need up to 9Mb of RAM to cope with it. And that's before you start thinking of running animations or slide shows along with it.

It also doesn't allow a great deal of control over the soundtrack. You can lower the overall level of the music relative to the sound effects, or the left and right channels respective to each other, but you can't do even rudimentary mixing, like dropping the drums out during a certain section, or emphasising the bass line. You're stuck with what you recorded in the first place. To get more control of the music you have to actually create it yourself on the Amiga.

DOUBLING UP

The easiest and cheapest way to make music on the Amiga is to use a tracker program. A tracker is a basic sequencer that uses the Amiga's four channels of sound. You enter notes as events in four different channels, and the program plays the sequence back. The actual sounds that the Amiga produces can be culled from various sources (see separate box called Sample It for details).

This is all well and good, but we're still stuck with the Amiga's inherent four channel limitation. There is actually one tracker program called OctaMED that gets round this problem, rather ingeniously, by splitting each channel into two, thus providing eight channels of sound instead of the standard four. It does this by internally re-sampling two different channels back on to one channel, much like the ping-pong technique that is used to bounce tracks together on a multi-track tape recorder.

OctaMED is a great program, available through public domain (or on the cover disk of our sister magazine *Amiga Format*, issue 62), but there are still problems with the eight channel option. Because the sounds have to be re-sampled in order to get two separate samples onto one channel, the quality of each sample drops quite noticeably. If it's percussion sounds, or fairly rudimentary sound effects, then you can usually get away with it, but if you were expecting to reproduce that lush grand piano you've always wanted, you may find the results you're after a tad more elusive.

Even if you expand to eight channels, you're still not getting the most out of your Amiga. Playing a four note chord, for example, means that you've only got another four notes to play with, and by the time you've put together a decent drum kit, you're back in the position of finding more notes from somewhere. It may sound like the dreaded musicians disease (the "I just need one more bit of equipment" syndrome), but it's inevitable that it won't take long before your musical ambitions outgrow the limitations of even an eight channel tracker. If this is the case you only have one more option. Fortunately it's a highly exciting, and immensely rewarding one, and it goes by the name of MIDI.

THE WONDERFUL WORLD OF MIDI

MIDI's great. MIDI's wonderful. In fact, if it weren't for MIDI, the idea of using computers for music would almost certainly have got stuck in a rather large and claustrophobic rut. MIDI allows you to expand your musical resources immeasurably. If you've never come across a MIDI system before, take a look at the separate box called "MIDI in a nutshell" for a brief guide.

With MIDI all your polyphony problems are solved. Why? Because you're not relying on the Amiga's sound chip to produce the sounds, you're throwing the polyphonic problem out to other pieces of equipment. Fortunately, the pieces you're giving the problem to are dedicated pieces of musical equipment, so they can spend all their time playing notes while the Amiga relaxes and tells them what to do.

With the first keyboard synthesisers, the polyphony problems wasn't solved straight away by MIDI, as many keyboards were monophonic (could only play one sound at a time), and therefore even more restricted than the Amiga. Even polyphonic keyboards could only play eight notes at a time, and all on the same sound, so at the most you could get richer piano or organ chords, and that was about it. Of course you could link another keyboard to the MIDI chain to get another set of eight notes, and so on, but this soon becomes extremely expensive

> **"Now you can create full band arrangements, and the only upgrade to your equipment has been a multi-timbral synth, a MIDI interface for your Amiga and some sequencing software."**

The real saviour of polyphony (sounds a bit like a biblical character, doesn't it?) was a wonderful device known as the multi-timbral synth. A multi-timbral synth actually emulates the expensive solution described above – it's one synth which behaves like a whole group of synths. Or to put it more accurately, it's a whole group of synths stuffed into one box.

Because MIDI can send information on up to 16 different MIDI channels, a multi-timbral synth is designed so that you can set one sound to be triggered on one channel, another on the next channel and so on. The number of different channels that a multi-timbral synth can respond to at a time is designated by the number of "Parts" that it can play. So for example, an eight part multi-timbral synth could be set up to play sounds arranged like this:

Part 1 – Channel 1 – Bass Guitar
Part 2 – Channel 2 – Piano
Part 3 – Channel 3 – Guitar
Part 4 – Channel 4 – Strings
Part 5 – Channel 5 – Trumpet
Part 6 – Channel 6 – Sax
Part 7 – Channel 7 – Whistling Wind noise

Part 8 – Channel 10 – Drums (note, it is standard practice when working with MIDI to set drums to respond to MIDI channel 10)

Now that looks more like a band. Polyphony is finally in our grasp. The greatest news of all is that multi-timbral synths are usually not just 8-note polyphonic, which is to say that they're not restricted to just playing 8 *notes* at a time. The minimum is usually 16 note polyphony, which can be split across the 8 parts anyway you like. For the bass, guitar, strings, trumpet, sax and whistling wind, you may only use one note at a time, while on the piano and drums you have 10 notes of polyphony left to you, giving you five for each or whatever.

Now that's what we call making music. Now you can create full band arrangements, and the only upgrade to your equipment has been a multi-timbral synth, a MIDI interface for your Amiga, and some sequencing software. But believe it or not, we're still going to find some limitations, especially when striving for that huge orchestral sound that we set out to accomplish.

Of course, the options for expanding from here on get progressively more expensive. The easiest way is to take advantage of MIDI's built-in chaining capabilities. For example, after you've set up your 8 part, 16 note polyphonic multi-timbral synth (see how easy it is to start talking jargon), you can go out and buy *another* eight part multi-timbral synth, link it up to the first, set each part to the other eight channels we haven't used yet in the MIDI system, and voila, we have a 16 part multi-timbral set-up. The layout of instruments might now look something like this:

SYNTH 1

Part 1 – Channel 1 – Bass Guitar
Part 2 – Channel 2 – Piano
Part 3 – Channel 3 – Guitar
Part 4 – Channel 4 – Violin
Part 5 – Channel 5 – Trumpet
Part 6 – Channel 6 – Sax
Part 7 – Channel 7 – Whistling Wind noise
Part 8 – Channel 8 – Triangle

SYNTH 2

Part 1 – Channel 9 – Flute
Part 2 – Channel 10 – Drums
Part 3 – Channel 11 – Piccolo
Part 4 – Channel 12 – Vibes
Part 5 – Channel 13 – Harp
Part 6 – Channel 14 – Organ
Part 7 – Channel 15 – Cello
Part 8 – Channel 16 – Viola

Wow, that's surely as much as you could ever want. At last we've reached our goal, yes? Well, no, not quite, because despite the large number of instruments we're using, there are still plenty of opportunities for running up against limitations. For example, say that in one particularly note-heavy bar, the organ is playing a full ten note chord, both hands slammed to the keys, the piano is doubling it with another ten notes, the harp is strumming aggressive arpeggios plowing through about eight notes at a time, and suddenly the polyphony (in terms of how many notes you can play simultaneously) is being seriously threatened.

With only a 16 note polyphony, the two synths combined can play 32 notes simultaneously, but we're nearing 30 of them, and we're only playing three instruments! There's no room for that beautiful trumpet melody, or that string crescendo you wanted to put in during the climax. Bummer.

As you can see, it's not that hard to run up against these sorts of problems, and it's precisely because musicians are demanding more from their equipment all the time (ungrateful miscreants that they are), that solutions are happily available.

The most obvious solution, and at first sight the *only* solution, is to get a multi-timbral synth which supports more polyphony. Perhaps replace Synth 1 in our example with a 32 note polyphonic synth, thus doubling the number of notes it can play at a time. After robbing another bank, you might want to buy another 32 note polyphonic synth to give you 64 note polyphony overall.

You can also upgrade some pieces of equipment totally independently. For example, there might be a MIDI equipped electronic piano out there which has just the right piano sound for you, is capable of 16 note polyphony on its own, and could slot in right next to your multi-timbral synths. You'll lose one of the parts in your multi-timbral set-up (because MID only has 16 MIDI channels, and you'd effectively be creating 17), but your new piano would not have to share its polyphony with the rest of the multi-timbral synth, it would have its own 16 notes all to itself. The multi-timbral synth can be left to get on with padding out the brass and string sounds, or whatever.

Many people buy dedicated MIDI-fied drum machines for the same reason. It's not just the extra polyphony that these instruments give you, of course, it's also the increased quality of the sound from dedicated units. A synth that has been built to re-create the sound on a piano is often more convincing than pre-set A11 on your multi-timbral synth, and dedicated drum machines are far better at providing more powerful percussive noises than the drum section on a multi-timbral synth.

If none of these attempts to build your own orchestra are satisfactory, there's only one more solution, and that is to expand the number of MIDI channels that you have at your disposal. This is possible, but you have to have the feature built in to the sequencer you are using, plus a MIDI interface that supports the feature.

It works by providing you with more than one MIDI Out port form your Amiga. Each Out port can convey 16 channels of MIDI information, the sequencer software directs the music you record to the MIDI Out port of your choice. For example, you could record 16 channels using MIDI Output A, by assigning them to channels A1 to A16, and then another 16 MIDI channels from B1 to B16. YOu could even expand to three MIDI Out ports, and beyond. Both Music-X 2.00 and Bars and Pipes Professional 2.5 are capable of accessing multiple MIDI Outs, but don't forget, you have to find the requisite hardware too.

Thirty two MIDI channels, a roomful of multi-timbral synths, a dedicated MIDI piano, drum machine and electric organ – at last we're finally getting towards our orchestration. I'm not going to pretend that it's not expensive, and of course there is a lot of equipment to get your head round, but it's possible, and more than that, it's an achievable goal.

Of course, while you're building your equipment up to that level, you can always take your Amiga in to a pre-production studio and take advantage of all the musical MIDI equipment that they have at their disposal.

And if after all this expansion, you're still struggling to get those last few notes out, remember your final option – the trusty Amiga's 4 channel sound chip. AS

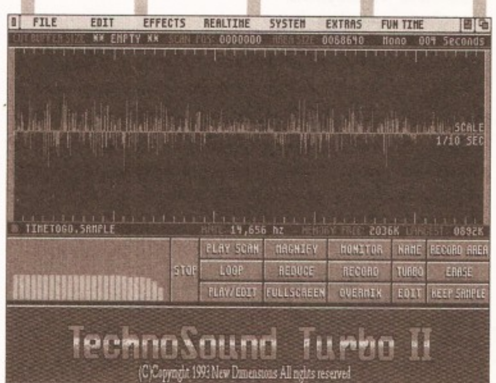
MIDI IN A NUTSHELL

MIDI is a communication system which allows pieces of MIDI equipment to talk to each other digitally. In the case of the Amiga, this means that, with the appropriate MIDI hardware and MIDI recording software (or sequencer, as it's more commonly known), you can record a musical performance and play it back. The minimum requirement for an effective MIDI recording is an Amiga (obviously), a MIDI interface (which plugs into the serial port on your Amiga, and allows you to connect your Amiga to other MIDI equipment), and a MIDI keyboard synthesiser.

To set up the MIDI system you simply connect the keyboard to the MIDI interface on the Amiga using MIDI leads. The essential difference between a MIDI recording and a sample is that with MIDI you're not recording any sounds. What you're recording is the MIDI data which triggers the sounds in the synth. For instance, if you press the key middle C on your keyboard, the sequencer records the fact that you pressed the middle C key at a certain time, and NOT the actual sound of that middle C.

When you play it back, the middle C event is sent back down the MIDI lead to the synth, where it sounds the note middle C, just as playing the note on the keyboard triggered the sound in the first place. If you unplug the MIDI connection between the Amiga and the synth, you won't hear any sounds, because the Amiga isn't producing the notes, it's just telling the synth to produce them.

Apart from the obvious advantage of giving you many more musical sounds to play with, it's also extremely useful because it allows you to edit the music after you recorded it, just like a word processor allows you to edit your words after you've written them. So, if you play a note wrong, you can simply delve into your sequencer and put it right. Phenomenally handy!



You must get a sampling package for your Amiga, you really must. It's so useful, and fun.

C PROGRAMMING

Toby Simpson continues his quest to turn you into a fully fledged C programmer. This month – adding a Graphical User Interface.

Last month we created a useful CLI utility which would find files on your disks. Particularly handy for large hard disks with stacks of directories when you're trying to find where you left something! Using some of the skills, such as Lists, Windows and Gadgets we have learnt over the past months we're going to start to put a Graphical User Interface on to the program and turn it into a genuinely useful tool.

As with last month's code, this program is designed to make use of the features which Commodore added to the operating system from Kickstart 2. If you have Kickstart 1.3 or below, then to be honest, you should upgrade to at least 2.1, preferably 3.1. These new features have over halved the size this Finder program would have had to have been otherwise.

Before you can start work on any project like this you have to have a good solid plan. Due to careful design last month, we can easily insert a pretty graphical interface to our program simply by intercepting the NotifyFind() routine. Last month, this routine looked rather simple:

```
BOOL NotifyFind(char *file)
{
    files_matched++;
    printf("%s\n", file);
    return TRUE;
}
```

I've removed the comments to make it shorter, but as you can see, every time our search code found a match it called this routine - which just incremented a counter and printed the match on the screen.

What we're going to do this time is make some changes to NotifyFind() so it adds the match to a long list, and then continually updates this list onto the screen. Instead of having to build a list visually on the screen ourselves, we're going to take a short-cut and make use of the "gadtools.library", a feature added with Kickstart 2 to simplify the creation of reasonably complex GUIs. This way the operating system will do all of the work for us, and all we have to do is build a list and inform the gadtools.library that it has changed. As well as our List Gadget, we'll create three buttons too, Find, Quit and Cancel. Although we won't do any work with these three this month, they will be used next time around and it makes sense to design them in at this stage.

In order to create any gadgets, we have to first open a window to put them on. With KickStart 2 we can use OpenWindowTags() which allows us to specify a whole list of features we would like, for example:

```
struct Window *new_window;
new_window = OpenWindowTags(NULL,
    WA_Title, "My new window!",
    WA_Width, 100,
    WA_Height, 50,
    TAG_DONE);
```

We specify a special list of things we require (using Tags, something we have looked at before), the operating system will use defaults for everything else. It makes jobs like this a whole lot easier. You'll note that above we specify values for the window width and height. This, in general is bad programming. If you are going to be polite visually you have to be prepared to tailor the way your program looks to the environment the user has set up.

For example, a 100x50 window is going to be very small indeed to a user with a Picasso graphics board running a Workbench of over 1000x1000. Bearing in mind also the wide range of fonts a user might prefer, it is good programming to try and make your interfaces consistent with the users choices. This month's program does this in two ways, it looks at the

LISTING

```
/****************************
** $Id:  finder.c
** File Finder Utility with wildcards for the
** Amiga Shopper C programming.
** By Toby Simpson
*/

#define  FINDER_VERSION "Finder 1.01(06.10.94)"

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <dos/dos.h>
#include <exec/exec.h>
#include <intuition/intuition.h>
#include <libraries/gadtools.h>
#include <clib/dos_protos.h>
#include <clib/exec_protos.h>
#include <clib/intuition_protos.h>
#include <clib/gadtools_protos.h>
#include <clib/alib_protos.h>

/* Defines: */
#define  TOTAL_GADGETS      4
#define BORDER              8
#define MIN_HEIGHT          130
#define MIN_WIDTH           320

#define GID_LIST            0
#define GID_QUIT            1
#define GID_FIND            2
#define GID_CANCEL          3

/* Function prototypes: */
BOOL  SearchDir(char *directory, char☛
*pattern);
BOOL  NotifyFind(char *file);
void  cleanexit(int returnvalue);
BOOL  OpenGUI(void);
void  CloseGUI(void);

/* Global variables: */
long  files_matched  = 0;  /* Total files☛
found */
char  *VERSION       = "\0$VER:"FINDER_VERSION;

struct Gadget *first_gadget, *context_gadget,
*previous_gadget;
struct Gadget *gadget_list[TOTAL_GADGETS];
struct Window *finder_window = NULL;

char  *button_text[] = {  "_Quit", "_Find",☛
"_Cancel", NULL  };

/* Library bases: */
struct Library *GadToolsBase = NULL;
struct Library *IntuitionBase = NULL;
struct List find_list;

/* void  main(void)*/

void main(int argc, char *argv[])
{
    char  search_dir[64];
    char  search_string[64];
    char  search_pattern[128];

    /* Title us and parse arguments:*/
    printf("%s\n", FINDER_VERSION);

    if (argc != 3)
      {
        printf( "Argument count☛
incorrect:\nUsage: FINDER path☛
matchpattern\n");
        return;
      }

    strcpy(search_dir, *++argv);
    strcpy(search_string, *++argv);

    /* Initialise our list: */
    NewList(&find_list);

    /* Open any libraries we might want:  */
    if (!(IntuitionBase =☛
OpenLibrary("intuition.library", 37L)))
      {
        printf("Can't open intuition library☛
V37\n");
        cleanexit(RETURN_FAIL);
      }
    if (!(GadToolsBase =
OpenLibrary("gadtools.library", 37L)))
      {
        printf("Can't open gadtools.library☛
V37\n");
        cleanexit(RETURN_FAIL);
      }

    if (!(OpenGUI()))
      {
        printf("Unable to open window\n");
        cleanexit(RETURN_FAIL);
      }

    printf("Scanning '%s' with a match string☛
of '%s'\n",
        search_dir, search_string);

    /* Pre-Parse the AmigaDOS search pattern:*/
    ParsePatternNoCase(search_string,☛
search_pattern, 127);

    /* Start the search: */
    if (!(SearchDir(search_dir,☛
search_pattern)))
        printf("Operation not totally☛
successful.\n");

    /* THIS IS SO YOU CAN SEE THE LIST */
    Delay(1000);

    /* End program stats:   */
    printf( "Operation complete, %ld matches☛
found.\n", files_matched);
    cleanexit(0); /* Exit with no error code */
}

/* void  cleanexit(int returnvalue)
** Exits the program, closing
** any allocated resources.
*/

void  cleanexit(int returnvalue)
{
    struct   Node  *node;

    /* Shut down any GUI bits we opened:  */
    CloseGUI();
```

users default screen font and dimensions and creates a "reasonable" window size.

It's a very quick and dirty routine, and certainly is not perfect, but you can easily improve it:

```
   win_width = screen->Width / 3;
win_height = screen->Height / 3;
if (win_width < MIN_WIDTH)        win_width =☛
MIN_WIDTH;
if (win_height < MIN_HEIGHT) win_height =☛
MIN_HEIGHT;
   win_x = (screen->Width / 2) - (win_width☛
/ 2);
win_y = (screen->Height / 2) - (win_height☛
/ 2);
```

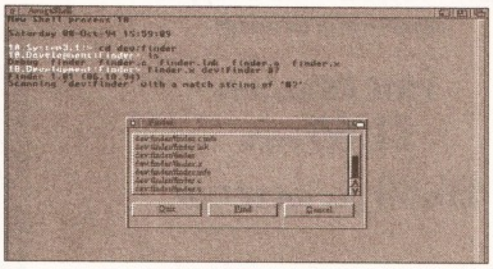
In the above code, we look at the current screen sizes to calculate respectable window dimensions, but we don't allow them to be below a certain size. With this information, we can then easily centre the window on the screen by calculating the top left hand corner position of the window as a function of screen size and window size.

You may notice that we've looked at screen information, and since we have not opened a custom screen, where did we get this from? Well, we ask the operating system what the current default public screen is. This is normally the Workbench, unless you change it. We then get read-only access to the screen's Screen structure, which contains useful information we want to use.

See the include file "intuition/screens.h" for a full definition of the screen structure. This is the code we use to get hold of the screen information:

```
    if (!(screen = LockPubScreen(NULL)))
    {     printf("Unable to lock default☛
public screen.\n");
    return FALSE;
    }
```

Creating gadgets using GadTools is straightforward. You'll notice that the listing contains some code to calculate the size's of all the gadgets to fit in the window size we chose. These gadgets are then created one after the other, the List first, and then the three buttons. Since the three buttons are almost identical, we can shorten this code by using a loop.



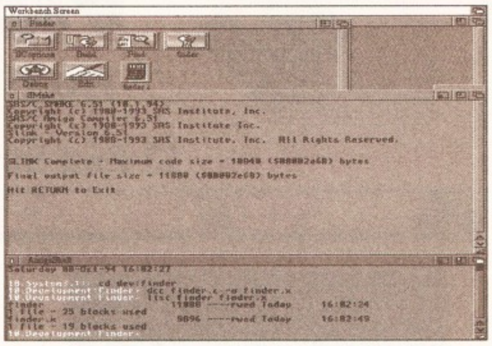
The finder in action! Note the rather nice GUI front end...

LOOPS AND BUTTONS

Using a loop in this way also makes it very easy to add further buttons in the future should we decide to. To make this possibility easier, the total number of gadgets and the button text are stored as easily changeable values at the start of the program:

```
#define  TOTAL_GADGETS      4
char  *button_text[] =
   {
   "_Quit", "_Find", "_Cancel", NULL
   };
```

The underscore symbols, incidentally are going to be our keyboard short-cuts for the buttons.



Compiling the program in DICE and SAS/C. Note the differences in sizes

GadTools automatically puts the underscore underneath the character immediately after it, so long as we specify a special tag when creating our gadgets. (This tag is GA_Underscore). When the gadgets are set up correctly, we can then add these to the window using AddGList(), and finally calling a couple of refresh functions to ensure that they are fully drawn.

The window and gadgets are now ready to use. Managing a List-ViewGadTools List-View gadgets are quite simple. They consist of a bevelled rectangle which contains the list of items, and a slider gadget on the right of it with two little arrow buttons to allow the user to scroll around the list. List-View gadgets use a standard exec linked list to display items. We dealt with lists a couple of months ago, they consist of a collection of Node structures, each node being one item in the list.

continued on page 77

```
   /* Close libraries:  */
   if (IntuitionBase)☛
CloseLibrary(IntuitionBase);
   if (GadToolsBase)CloseLibrary(GadToolsBase);

   /* Free our list: */
   while (node = RemHead(&find_list))
      {
      free(node->ln_Name);
      free(node);
      }

   /* Exit program with correct error code: */
   exit(returnvalue);
}

/* BOOL  SearchDir(char *directory, char☛
*pattern)
**
** Search the named directory. All variables
** are local, this function is recursive.
** Returns TRUE if the operation was OK, or
** FALSE for an error.
*/

BOOL  SearchDir(char *directory, char☛
*pattern)
{
#ifdef _DCC
   __aligned struct FileInfoBlock  fib;
#else
   struct   FileInfoBlock __aligned    fib;
#endif

   BPTR      lk     = NULL;
   char      full_path[255];

   /* Attempt to get a lock and initial FIB*/
   if (!(lk = Lock(directory, ACCESS_READ)))☛
return FALSE;
   if (!(Examine(lk, &fib)))     return FALSE;

   /* Scan directory:   */
   while (ExNext(lk, &fib))
      {
      /* Deal with CTRL-C: */
      if (SetSignal(0L, SIGBREAKF_CTRL_C) &☛
SIGBREAKF_CTRL_C)
      {
      printf("*** Program Aborted\n");
   UnLock(lk);
      return FALSE;
      }

   /* Build full path spec:   */
   strcpy(full_path, directory);
   AddPart(full_path, fib.fib_FileName, 255);

   /* ID File entry type:  */
   if (fib.fib_DirEntryType > 0)
      {
      /* recursively scan directory:   */
      if (!(SearchDir(full_path, pattern)))
         {
         UnLock(lk);
         return FALSE;
         }
      }
      else
         {
         /* Got a file, try a match check:  */
         if (MatchPatternNoCase(pattern,☛
fib.fib_FileName))
            NotifyFind(full_path);
         }
      }

   UnLock(lk);
   return TRUE;
}

/*BOOL    NotifyFind(char *file)
** Notify that a file was found. The
** file which matched is passed in
** and this is then shown on the screen in
** what every way the program
** decides. Returns FALSE for an error.
** (This months version always
** returns TRUE however)
*/

BOOL  NotifyFind(char *file)
{
   struct   Node  *node;
   char     *text_ptr;

   /* Count matches: */
   files_matched++;

   /* Allocate memory for a list node:*/
   if (!(node = (struct Node ☛
*)malloc(sizeof(struct Node))))
      return FALSE;

   if (!(text_ptr = malloc(strlen(file) + 1)))
      {
      free(node);
      return FALSE;
      }

   /* Initialise new node & add it to list: */
   strcpy(text_ptr, file);

   node->ln_Name = text_ptr;
   node->ln_Pri = 0;

   AddTail(&find_list, node);

   /* Update display gadget so it shows the ☛
new list:   */
   GT_SetGadgetAttrs(gadget_list[GID_LIST], ☛
finder_window, NULL,
      GTLV_Labels, &find_list,
      GTLV_Top, files_matched,
         TAG_DONE);

   return TRUE;
}

/* BOOL  OpenGUI(void)
** Opens the GUI components for our program.
** This means opening the window with gadgets
**on it. Returns TRUE for success, FALSE for a
** failure.*/

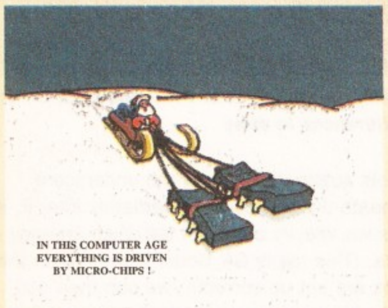
BOOL  OpenGUI(void)
{
   struct   Screen   *screen;
   void  *vi;
   long  gadget_count = 0;
   long  win_width, win_height, win_x, win_y;
   long  button_width, button_height, ☛
button_start;
```

Listing continued on page 77

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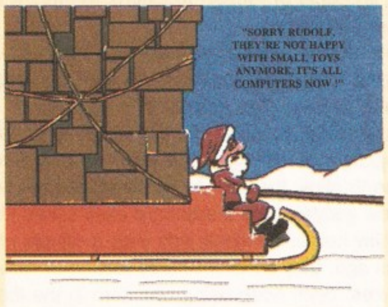
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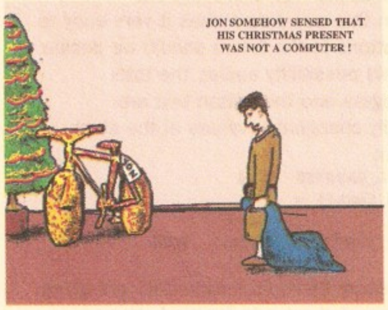
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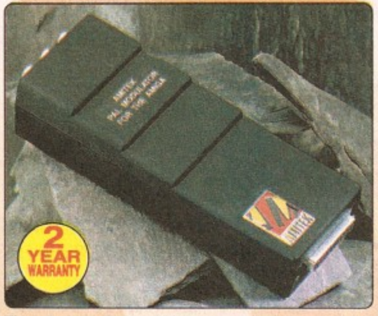
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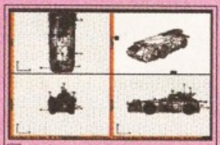
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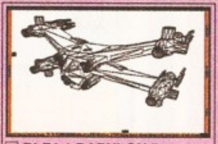
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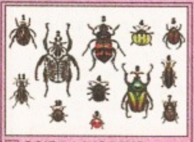
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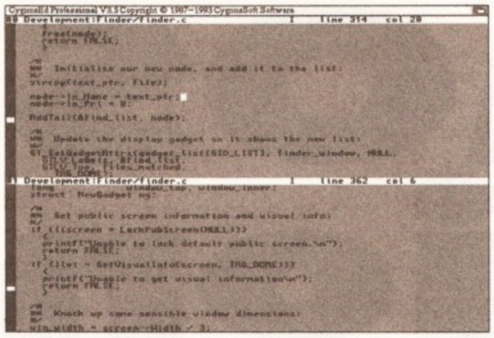
Each node is linked by pointing to the node after it, and the node before it. If we want to display a list on a list-view, we call the gadtools.library function GT_SetGadgetAttrs() and specify a pointer to the list in question:

```
GT_SetGadgetAttrs(gadget_list[GID_LIST],
finder_window, NULL,
     GTLV_Labels, &find_list,
     GTLV_Top, files_matched,
        TAG_DONE);
```

...you have to specify the gadget in question, the window it is on, and then a tag-list of relevant items. In this case we are specifying a pointer to our list structure, and also asking for the top displayed item to be the last in the list. This just ensures that as items get added during the search, the list scrolls down so you can always see the bottom item.

Creating lists is very straightforward, and requires only a few changes to our NotifyFind() routine of last month. The procedure is:

- Allocate a node structure.
- Allocate enough RAM to store the match string (the actual file the search code matched, which we last month we simply printed on the shell window using printf()).
- Copy the match string to the memory we allocated for it.
- Set up the new node structure so that its ln_Name field points to the match string memory.
- Add the new node to the end of our list using AddTail(list, node).
- Finally, use GT_SetGadgetAttrs() to update the list-view gadget on the screen.



You can use any TextEditor (in this case CygnusEd) to type in the listing.

Having created a large list, it is vital to remember to free the memory it has taken. We have added a small routine at the end of the program which does this:

```
while (node = RemHead(&find_list))
   {
   free(node->ln_Name);
   free(node);
   }
```

Note that we are remembering to free the memory used by the match string as well as the node structure itself. The RemHead() function allows us to remove items off the list.

Another thing worth remembering about lists is that it is VITAL to call NewList() on it to initialise the list before using it. If this is forgotten, then your Amiga might become very upset indeed! It is very simple:

```
NewList(struct List *);
```

For us, that's just NewList(&find_list);.

HOW IT'S ALL PLUGGED IN

In order to try and keep the program as organised as possible, the functions responsible for opening and closing the GUI are separate calls, OpenGUI() and CloseGUI(). Also, because there are now several places where the program can fail (like, for example, the window did not open correctly), we've separated the program exit routine into a special function called cleanexit(). This then closes everything we'd opened at that point and returns an error code if necessary.

This organisation will make it nice and easy to add new features next month.

USING THE LISTING

The listing has been tested under both SAS/C and DICE. In order to use the listing with DICE you will need a reasonably recent version, such as that which is provided with Amiga Shopper's "Complete Amiga C" book.

The listing should work with very little adaptation on any Amiga C compiler, however. The program still has to be run from the CLI, but it's easy to use. If you've compiled it as "Finder", you can search your workbench disk or partition for any file containing "oo" in it like this:

```
finder sys: #?oo#?
```

Next month we'll be making the program run from the Workbench, and make the buttons work and start thinking about how to add ARexx support to the program. See you then! AS

Listing continued from page 73

```
   long  list_width, list_height, list_start;
   long  window_top, window_inner;
   struct  NewGadget ng;

   /* Get public screen info & visual info: */
   if (!(screen = LockPubScreen(NULL)))
      {
      printf("Unable to lock default public ☛
screen.\n");
      return FALSE;
      }
   if (!(vi= GetVisualInfo(screen, TAG_DONE)))
      {
      printf("Unable to get visual info\n");
      return FALSE;
      }

   /* create sensible window dimensions: */
   win_width = screen->Width / 3;
   win_height = screen->Height / 3;
   if (win_width < MIN_WIDTH)    win_width = ☛
MIN_WIDTH;
   if (win_height < MIN_HEIGHT) win_height =
☛ MIN_HEIGHT;

   win_x = (screen->Width / 2) - (win_width /
☛ 2);
   win_y = (screen->Height / 2) - ☛
(win_height  / 2);

   /* Open the window we are going to use: */
   if (!(finder_window = OpenWindowTags(NULL,
      WA_Title,         "Finder",
      WA_Left,          win_x,
      WA_Top,           win_y,
      WA_Width,         win_width,
      WA_Height,        win_height,
      WA_RMBTrap,       TRUE,
      WA_NewLookMenus,  TRUE,
      WA_Activate,      TRUE,
      WA_CloseGadget,   TRUE,
      WA_DepthGadget,   TRUE,
      WA_DragBar,       TRUE,
      WA_IDCMP,         IDCMP_REFRESHWINDOW |
            IDCMP_CLOSEWINDOW |
            LISTVIEWIDCMP |
            IDCMP_GADGETUP |
            BUTTONIDCMP |
            IDCMP_VANILLAKEY |
            IDCMP_RAWKEY,
      TAG_END)))
      {
      printf("Unable to open window!\n");
         return FALSE;
         }

   /* Create context gadget:  */
   first_gadget = NULL;
   context_gadget = ☛
CreateContext(&first_gadget);

   /* Set up defaults:  */
   memset(&ng, 0, sizeof(struct NewGadget));
   ng.ng_VisualInfo = vi;
   ng.ng_Flags = 0;
   ng.ng_UserData = NULL;
   ng.ng_TextAttr = screen->Font;
   ng.ng_GadgetID = 0;
   previous_gadget = context_gadget;
   window_top = finder_window->BorderTop + ☛
BORDER;
   window_inner = win_height - (window_top) ☛
-  (finder_window->BorderBottom + BORDER);
   list_width = win_width - (BORDER * 2);
   button_width = (list_width / 3) - BORDER;
   button_height = screen->Font->ta_YSize + ☛
BORDER;
   list_height = window_inner - ☛
button_height  - (BORDER * 2);
   list_start = window_top;
   button_start = window_top + list_height ☛
+ BORDER;

   /* Create list-view first: */
   ng.ng_TopEdge      = list_start;
   ng.ng_LeftEdge       =  BORDER;
   ng.ng_Width          = list_width;
   ng.ng_Height         = list_height;

   gadget_list[gadget_count] = ☛
CreateGadget(LISTVIEW_KIND, previous_gadget, ☛
&ng, GT_Underscore, '_', TAG_DONE);

   previous_gadget = ☛
gadget_list[gadget_count];
   gadget_count++;

   /* Now create our buttons: */
   ng.ng_LeftEdge = BORDER;
   ng.ng_TopEdge = button_start;
   ng.ng_Width = button_width;
   ng.ng_Height = button_height;
   ng.ng_GadgetID = ng.ng_GadgetID + 1;

   while (button_text[gadget_count-1])
      {
      ng.ng_GadgetText = ☛
button_text[gadget_count-1];

      gadget_list[gadget_count] = ☛
CreateGadget(BUTTON_KIND, previous_gadget,
      &ng, GT_Underscore, '_', TAG_DONE);

      previous_gadget = ☛
gadget_list[gadget_count];
      gadget_count++;
      ng.ng_LeftEdge += (button_width + ☛
BORDER);
      ng.ng_GadgetID = ng.ng_GadgetID + 1;
      }

/* fail if gadgets were not created☛ right*/
   if (first_gadget == NULL) return FALSE;

   /* Add our buttons to the window:  */
   AddGList(finder_window, first_gadget, 0,☛
~0, NULL);
   RefreshGList(first_gadget, finder_window,☛
NULL, ~0);
   GT_RefreshWindow(finder_window, NULL);
   return TRUE;
}

/* void  CloseGUI(void)
** Closes any GUI components we opened, such
**as the window or gadgets for example.*/

void  CloseGUI(void)
{
   if (finder_window) ☛
CloseWindow(finder_window);
   if (first_gadget) FreeGadgets(first_gadget);
}
```

AMOS Action

Simon Green, the king of AMOS, gives scrolls his seal of approval. Plus – fun with mice.

Games do it, demos do it, even commercial word processing programs do it. But what is it? Scrolling. The Encyclopaedia of Microcomputer Terminology defines scrolling as "the ability to move text on a screen row by row from top to bottom or bottom to top. New text appears from one border as the reviewed text disappears (exits) from the opposite border... May also refer to the ability to move text column by column from left to right and right to left". Mind you, that was written in 1983, long before the arrival of software such as Cygnus Ed Professional and Alien Breed. In general, scrolling can be described as anything that gives the impression of moving a fixed window over a larger area of text or graphics.

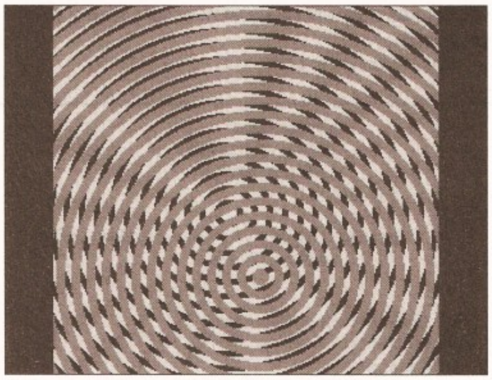
Scrolling works because movement is always perceived relative to your frame of reference. For example, moving text upwards on the screen whilst you eyes remain fixed is equivalent to moving your eyes down the page whilst reading a stationary piece of paper. Anyway, I think that's more than enough of my pseudo-intellectual ponderings for one issue.

HARDWARE V. SOFTWARE

There are two main ways in which scrolling can be achieved on the Amiga. They are usually referred to as hardware scrolling and software scrolling. This is perhaps a bit misleading since both methods obviously involve both hardware and software, but the names have stuck.

One of the great things about the Amiga is its incredibly clever and flexible display hardware. The Amiga can do things such as having multiple screens with different resolutions and numbers of colours on the display at once, that are simply not possible on other machines. The Amiga is unusual because it doesn't have a fixed area of memory dedicated to being video memory. The display can be fetched from any area of "Chip" memory. This means that it is possible to create a bitmap in memory that is larger than the visible screen. By instructing the hardware to display different parts of this large bitmap, scrolling can be achieved. This is hardware scrolling.

In software scrolling, the display remains fixed on a certain area of memory, whilst the processor or the blitter is used to physically move the pixels around in memory.



It may not look very exciting here, but when those circles move get ready for some very weird interference effects.

INTERFERENCE

In AMOS, hardware scrolling is easily achieved using the "Screen Offset" command. The program given in listing one demonstrates hardware scrolling with a pretty interference effect demo.

First of all, the program creates two 512 by 512 pixel screens, using "Screen Open". Both screens are displayed through 256 by 256 pixel windows, using the "Screen Display" command. The program draws a number of concentric circles on both screens. A "dual playfield" display is used, which basically allows us to overlay the two screens so that you can see one through the gaps in the other. The screens are scrolled around using the "Screen Offset" command, to produce the interference effect. The code at the bottom of the program makes the circles move around in an interesting way (it's simple harmonic motion, physics students). You can change the variables to produce different effects.

It's important to remember that although it looks as if the circles are moving around the screen, in fact the circles are fixed, and it's our viewpoint that is moving. Unfortunately, the display doesn't move as smoothly as it should, because of a slight bug in AMOS (or possibly my program), but it still looks so good I thought I'd publish it anyway. If anybody does get it to work properly, or has a better interference effect demo, I'd love to hear from them.

TEXT SCROLLING

The second listing demonstrates software scrolling, with a neat little horizontal text scroller, as seen in many demos. The twist is that this one can use any standard Workbench font, even

LISTING 1 – HARDWARE SCROLLING

```
' Interference effect demo
' using dual playfield and hardware scrolling
' Simon Green, 1994
'
' set up two identical screens
Screen Open 0,512,512,2,Lowres
Curs Off : Cls 0
'
' some nice colours
Colour 0,0
Colour 1,$F00 : Rem Red
Colour 9,$F0 : Rem  Green
'
Screen Open 1,512,512,2,Lowres
Curs Off : Cls 0
'
Screen Display 0,160,40,256,256
Screen Display 1,160,40,256,256
'
' join them together to make a dual playfield display
Wait Vbl
Dual Playfield 0,1
'
' draw some nice concentric circles
Screen 0
ODD=True
'
For R=5 To 256 Step 5
   Circle 256,256,R
   If ODD Then Paint 256+R-2,256,1
   ODD= Not ODD
Next
'
' copy to other playfield
Screen Copy 0 To 1
'
' scroll the playfields about to produce
' a nice interference effect
'
CX=128 : CY=128
X#=0 : Y#=0
VX#=0 : VY#=0
AX#=0.01 : AY#=0.02
'
Do
   Wait Vbl
   Screen Offset 1,Y#,X#
   Screen Offset 0,X#,Y#
   '
   X#=X#+VX# : Y#=Y#+VY#
   If X#<CX Then VX#=VX#+AX#
   If X#>CX Then VX#=VX#-AX#
   If Y#<CY Then VY#=VY#+AY#
   If Y#>CY Then VY#=VY#-AY#
Loop
```

TWO MICE ARE BETTER THAN ONE

When Douglas Engelbart invented the computer mouse in the early sixties, he probably had no idea just how popular his little rodent-like pointing device would eventually become. These days it is almost impossible to buy a personal computer without a mouse, and most people take them for granted.

The other day I was reminded that the Amiga hardware is actually capable of supporting two mice simultaneously. Few people realise just how flexible the Amiga's joystick ports are. Those two little 9-pin D connectors at the back of your machine might look innocent enough, but they hold a whole host of secrets. They support not only standard digital joysticks, but also analogue joysticks, paddles, light pens and, of course, mice.

Unfortunately, very little software takes advantage of this flexibility. Workbench only supports a single mouse. In fact, the only piece of software I can think of that does make use of two mice is the game "Lemmings", in two player mode.

Although AMOS provides ample support for using the mouse plugged into the standard mouse port, it completely ignores the possibilities of using a second mouse. To read from a mouse plugged into the second port, we need to write our own mouse driver that reads direct from the hardware.

Even if you don't have two mice, there are several reasons why you still might want to write your own mouse driver. It gives you much more control over how the movement of the mouse is translated to the movement of the pointer on the screen. You can change the scaling, add acceleration and inertia, or even make it so that the mouse pointer bounces off the edge of the screen.

LISTING 3 – READING FROM THE SECOND MOUSE PORT

```
' Reading from the second mouse port
' Simon Green, 1994
'
' addresses of joystick port hardware registers
_JOY0DAT=$DFF00A : Rem  Standard mouse port (1)
_JOY1DAT=$DFF00C : Rem  Second port (2)
'
MX=0 : MY=0 : Rem  Mouse position
_MINX=0 : _MAXX=319 : Rem  X bounds
_MINY=0 : _MAXY=199 : Rem  Y bounds
'
' Initialise counters
CX=Peek(_JOY1DAT+1) : CY=Peek(_JOY1DAT)
'
Do
   Wait Vbl
   MOUSEREAD[_JOY1DAT]
   Sprite 1,X Hard(MX),Y Hard(MY),1
   If Fire(1) Then Draw To MX,MY Else Gr Locate MX,MY
Loop
'
'
Procedure MOUSEREAD[HARDREG]
   Shared MX,MY,CX,CY,_MINX,_MAXX,_MINY,_MAXY
   '
   ' store previous mouse counter readings
   OCX=CX : OCY=CY
   '
   ' Read mouse x and y counters direct from hardware register
   CX=Peek(HARDREG+1)
   CY=Peek(HARDREG)
   '
   ' calculate deltas (change in counters since last reading)
   DX=CX-OCX : DY=CY-OCY
   '
   ' cope with counters wrapping round
   If DX<-127 Then Add DX,256
   If DX>127 Then Add DX,-256
   If DY<-127 Then Add DY,256
   If DY>127 Then Add DY,-256
   '
   ' update mouse position
   Add MX,DX : Add MY,DY
   '
   ' ensure mouse pointer doesn't go out of bounds
   If MX>_MAXX Then MX=_MAXX
   If MX<_MINX Then MX=_MINX
   If MY>_MAXY Then MY=_MAXY
   If MY<_MINY Then MY=_MINY
End Proc
```

proportional ones! The scrolling is achieved using the standard AMOS scroll commands "Def Scroll" and "Scroll", but it could just as easily be done with "Screen Copy".

When you run the program, it first reads the list of available fonts from your "fonts:" directory. If you like you can use the "Assign" CLI command (or the built-in assign command in AMOS Pro) to make it look for fonts on a disk other than the one you booted from. You are prompted to type in the number of the font you want to use. Next, you need to type in the speed that you want the text to scroll at. 1 is the slowest, and 20 is very fast, but the speed shouldn't be greater than the minimum width of a character in the font. Lastly, you need to type in the message that you want displayed.

The program might even be useful for video titling. If you do want to use it for this, you can make the screen interlaced by adding "+Laced" to the end of the second "Screen Open" command. The screen isn't double buffered, so it might flicker if you try and use very large fonts, or have a slow machine. I leave it as an exercise to add double buffering. Another fun thing you might like to try is to make the text more colourful by adding AMOS rainbows in the background.

MOUSE DRIVER

Listing 3 gives all the code you need to read from the second mouse port. Before you can run the program, you need to create a sprite to use as the mouse pointer. Load up you favourite sprite editor program and draw a nice crosshair or pointer, and save it as sprite number 1. Plug a mouse into the second port, run the program, and you should find that moving the mouse on your desktop causes the sprite to move on screen. Wow!

To use the code in your own programs, you need to call the "MOUSEREAD" procedure once every video frame (i.e. about 50 times a second). It takes as a parameter the hardware address of the joystick port to read from. This should be either "_JOY0DAT" for port 1, or "_JOY1DAT" for port 2, which are both constants defined at the beginning of the program. The current co-ordinates of the mouse are held in the two global variables MX and MY. To read the mouse buttons you can use the standard functions for reading the joystick fire buttons. Have fun!

THE LIBERATOR EXTENSION

Much to my disappointment, this extension has nothing to do with the freedom-fighting spacecraft from the '80s television series "Blakes 7". Instead, Liberator aims to give AMOS users a quick and easy way to call functions from the Amiga's operating system libraries.

It claims to provide access to over 1300 functions from 47 Commodore and 3rd party libraries. It also includes over 50 custom-written functions to make your programming life easier. The extension supports all versions of Workbench up to and including the very latest, v3.1.

Each library function can be called just as if it was one of AMOS' built-in commands. For example, a call to the graphics library function for drawing ellipses can be executed as follows:

VOID=F<drawellipse>(parameters)

Donald Cameron, the author of the extension, claims that with the Liberator extension "you can tackle almost any project with comfort – e.g. MIDI, Commodities, real Intuition/GadTools GUI's with real TaskWait status, DataTypes, Bullet glyph engines...". It does come with some impressive examples that show how it is possible to use Intuition screens, windows, menus, gadgets and requesters from AMOS, but they are somewhat complicated and difficult to follow.

The Liberator extension does make it possible to write proper multi-tasking Intuition programs with AMOS, but only with a great deal of effort. Don't expect that once you've bought this extension that you will immediately be able to create amazing Workbench applications. And don't expect that you'll be able to do everything you can do in AMOS (bobs, scrolling etc.) on the Workbench screen.

AMOS with the Liberator extension suffers from many of the same problems as HiSoft Basic 2's attempt to allow access to OS libraries. AMOS doesn't have structures, or a pointer type. This means that the only way to create the necessary structures for opening screens, windows etc. is to reserve memory in an AMOS bank, and then poke the data into it. This is not very elegant.

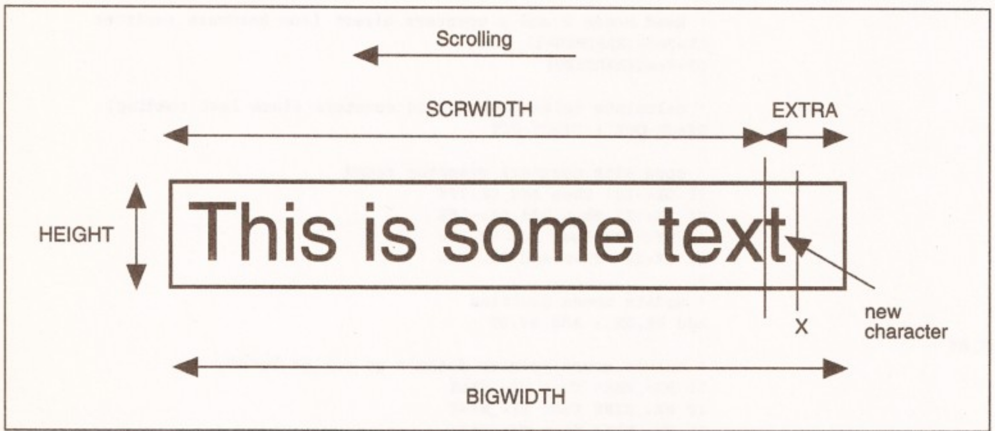
I've said it before, but if you really want to do a lot of OS programming, you'll find it a lot easier from C. The first rule of programming is to always use the language that is most suitable for the problem you're trying to solve. Personally, I wouldn't try to write a Workbench application in AMOS any more than I would try to write an arcade game in Prolog.

If this is liberation then I think most AMOS users would rather stay captive. Although a

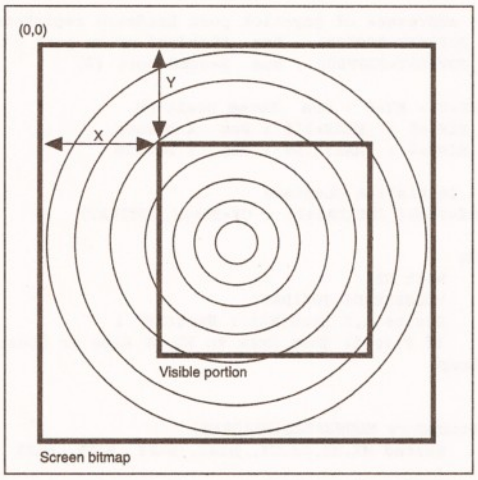
LISTING 2 – SOFTWARE SCROLLING

```
' Horizontal text scroller
' using hardware scrolling
' Simon Green, Sept.'94
'
Screen Open 0,640,256,2,Hires
Palette $48,$FFF : Wait Vbl
'
' display list of fonts
Print "Reading font list...";
Get Fonts
Print "done." : Print
N=1
Repeat
   Print N;Tab$;Font$(N)
   Inc N
Until Font$(N)=""
'
Print
Input "Choose a font: ";FONTNUM
Input "Scrolling speed? ";SPEED
Input "Message? ";MESSAGE$
Set Font FONTNUM
'
SCRWIDTH=640+16+16
EXTRA=16+Text Length("W")
HEIGHT=Val(Mid$(Font$(FONTNUM),30,4))
BIGWIDTH=SCRWIDTH+EXTRA+16
'
' open screen to display text
Screen Open 0,BIGWIDTH,HEIGHT,2,Hires
Screen Display 0,112,150,SCRWIDTH,
Curs Off : Palette $555,$FFF
EXTRA=Screen Width-SCRWIDTH
'
' define left horizontal scroll
Def Scroll 1,0,0 To Screen Width-1,Screen
Height-1,-SPEED,0
'
Set Font FONTNUM
Set Text %0 : Rem Style
'
X=0
C=1 : Rem  character counter
NC$=Mid$(MESSAGE$,C,1) : Rem   next char
'
Repeat
   ' if there is enough room
   If(X+Text Length(NC$))<=EXTRA
      ' draw the next character
      Text SCRWIDTH+X,Text Base,NC$
      X=X+Text Length(NC$)

      ' get next character in message
      Add C,1,1 To Len(MESSAGE$)
      NC$=Mid$(MESSAGE$,C,1)
   End If
   '
   ' scroll the text
   Wait Vbl
   Scroll 1
   X=X-SPEED
Until Mouse Key<>0
'
End
```



Simple scrolling is easily achieved in AMOS, and you can happily create your own scrolly text demo.



considerable amount of effort has obviously gone into producing it, £22.50 seems like a lot to pay for an extension that doesn't really do anything. On the other hand, if you really do need to access OS library functions from AMOS, then the Liberator extension does provide a slightly easier method of doing it than looking up all the library vector offsets yourself.

One thing's for sure, this Liberator is not likely to strike terror into the hearts of Servalan and Space Commander Travis of the evil "Federation".

OCTOBER ISSUE ERRORS

Regular readers will have noticed that here at *Amiga Shopper* we occasionally introduce small deliberate mistakes into the pages of the magazine, in an attempt to check whether anybody actually reads it. And seeing as nobody has pointed out any of the recent cock-ups on these pages, it would seem that nobody actually reads "AMOS Action". Oh well. Anyway, here's a list of boo-boos from October's issue:

Someone seems to have completely chopped off the last part of listing 1. The complete procedure should read:

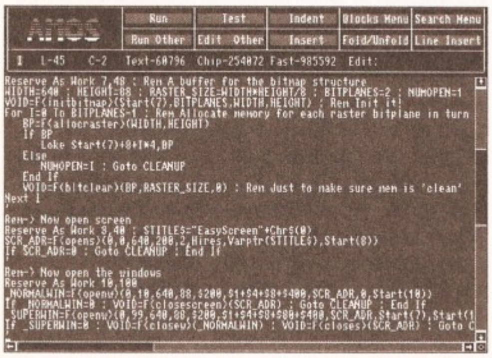
```
Procedure CHANGESPEED[CHAN,RATE]
   Shared CLOCKCONST
   ' Change the playback rate of a channel
   ' CHAN - Audio channel (0 to 3)
   ' RATE - playback rate (samples per second)
   '
   If CHAN<0 or CHAN>3 Then Pop Proc
' DANGER - make sure you type this next ☛
line correctly!
   AUDPER=$DFF0A6+CHAN*16
   '
   PERIOD=CLOCKCONST/RATE
   If PERIOD<124 or PERIOD>65535 Then Pop Proc
   '
   Doke AUDPER,PERIOD
End Proc
```

The line at the end of the main loop that reads "Until Mouse Key0" should obviously read "Until Mouse Key<>0". In the MIDI listing (listing 2), the "Until" line should read "Until BYTE<>-1", not "Until Byte-1", which doesn't make much sense. It looks to me as though Future's DTP system has something against the characters "<>".[I hate Quark Xpress *Ed]*

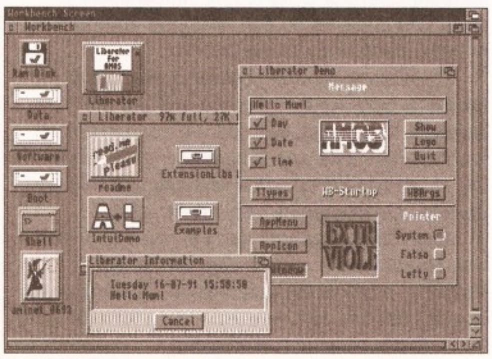
NEWS IN BRIEF

I was lucky enough to be given a brief demonstration of Europress' latest PC product "Click and Play" at the ECTS show. But why am I mentioning a PC program here? Well, "Click and Play" is written by none other than the author of AMOS, Francois Lionet. The project started of as an attempt to create a PC version of AMOS, but has now developed into a sort of mouse-controlled event-based games creation package.

Despite my original reservations, it is somewhat more sophisticated than the "Shoot-em-up Construction Kit". But not much. Don't expect it to do any kind of scrolling (it runs under Windows ™). Now, some of you might think that I'm slagging this off just because it's a PC product. Too right! AS



This is the kind of code you need to write to use the Liberator extension. Yikes!



...And these are the kind of results you can expect.

WHERE TO GET IT

Liberator extension – £22.50
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☎ 0292 570373

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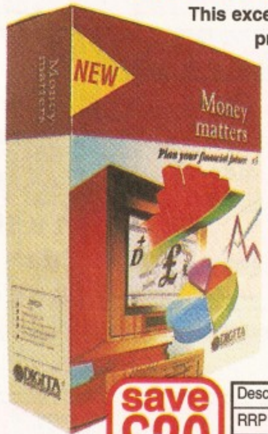
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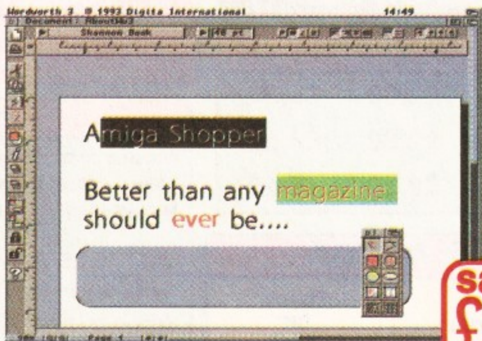


Although it has now been overtaken by *Wordworth 3*, this is still an excellent word processing program, especially at this price. *Wordworth 2* from Digita is a powerful, fast and packed with features such as Intellifont, which enables you to use fonts from 4 to 800 points in size, mail merging, a large dictionary and thesaurus, and an indexing system. An extremely powerful, flexible program which will suit nearly every Amiga user.

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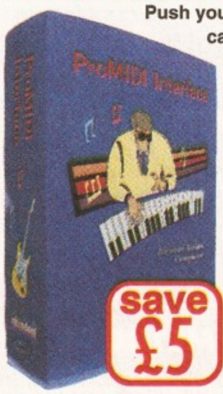


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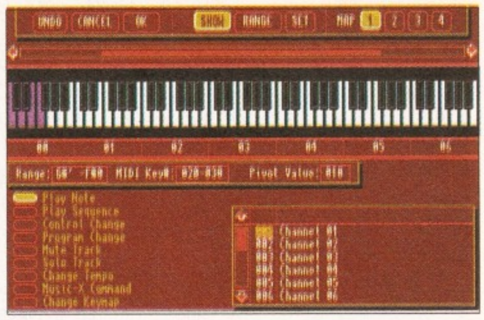


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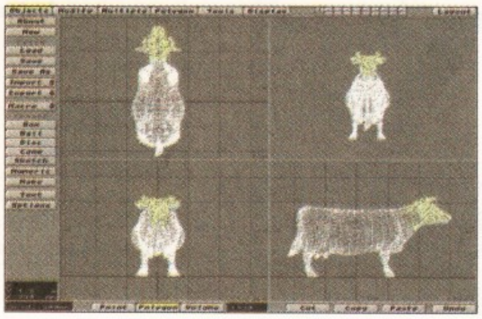
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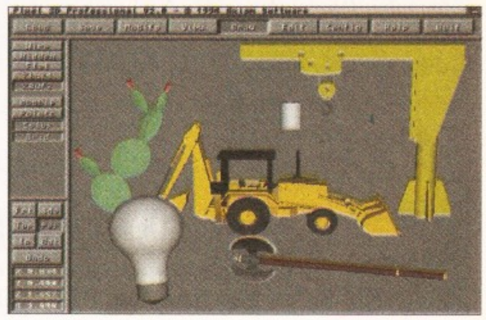
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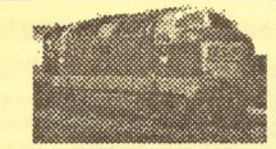
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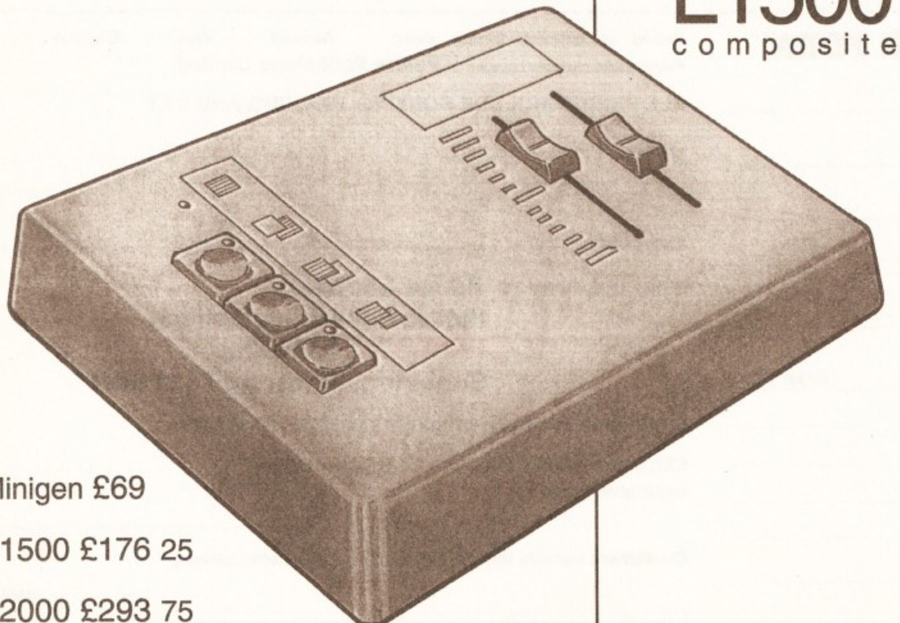
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£25 WINNER

Some ideas for the future of the AMIGA, if I was to be in charge of marketing and promotion:

1. Advertise the range. When was the last time anyone saw an advert by Commodore (or whoever owns the company) for any AMIGA related product? Push, push, push the AMIGA product and software. They are now equal to, and better, in some cases than the oppositions.

2. Really sell to schools, with very good bulk buy deals and 'appropriate' software and networking included.

3. Allow developers of both software and hardware to have access to all new AMIGA developments, and guidelines, before release.

4. Lower the retail prices of the 4000 range and (perhaps) monitors also; provide higher specifications, as standard, as well.

5. Ensure extremely good service and warranty support, also provide (free?) help-line support too.

6. Sell, sell, sell the range to allow more people to have access to, and be able to and want to, have AMIGA products.

In more detail:

Here in Australia, apart from one local AMIGA magazine (the Australian Commodore & AMIGA Review), and the occasional report in the daily papers, the AMIGA range is not known publicly at all. We still have many user groups and many good stores around Australia for the AMIGA range, but unless you 'are in the know' as it were, you would never even be aware of these excellent machines, and their capabilities.

Too often you will see a 1200 AMIGA in a shop with a 1084S monitor and flicker galore, because the assistants don't know how, or won't, utilise the preferences to ensure a decent display. Never have I seen a 1200 with a "proper" monitor on display.

> *"To sell any product you have to advertise... you have to spend money to make money."*

Many schools have used AMIGA computers in the past (the A500?), but have now forsaken the machine for the IBM or Apple ranges. This is probably due to lack of support and advertising from Commodore and also lack of advertising by Commodore approved retailers and education re-sellers. Then again, with very poor marketing, how would schools and Education departments even know about the AMIGA? I would suggest a very heavy concentration by the marketing department, including offering discounts for bulk purchases with appropriate software, and networking, to all schools Junior, Primary, Secondary and Tertiary.

If you want to have AMIGA computers in schools, you have to let them know we are there, what we have to offer, and that we can back up all our products.

Provide all developers for the AMIGA with enough forward information to enable them to develop and cater for the range, and also ensure that all 'outside' products confirm with Commodore guidelines, which should establish a standard (like IBM stuff) to which all software and hardware makers will adhere. Maybe this might enable software to be released with no "known" bugs. We may even see a CD-ROM drive for the 1200 which does not occupy the trapdoor expansion slot, too?

To sell any computer you must have an excellent back-up, services and warranty operation, with a help-line facility, just like the opposition and yet, where do we stand? Here in Australia this has all been almost non-existent, to the obvious detriment of the AMIGA. Here's for improvement when the new owners arrive.

To sell any product you have to advertise in all media, and keep on doing so, even if it costs money; after all, even huge companies like Coca-Cola have to advertise. I realise that advertising costs money, but you have to spend money to make money. The appalling lack of advertising in Australia for nay of the AMIGA range, I have yet

CHATTING TO THE VICE PRESIDENT

To: Al Gore, American Vice President
Address: Vice-president@whitehouse.gov
RE: The Information Superhighway

"Hi Al,

We at *Amiga Shopper* are committed to the concept of the Information Superhighway. As the work on this seems to be rather slow at present, we have decided to get things moving by offering you the indefinite loan of one of our modems. It's a Supra 2400Zi, which will fit cozily inside your Amiga. It's a bit slow, but I'm sure it will help the Superhighway get moving.

Sincerely,

Richard Baguley
Editor

PS – Sorry, but there is no clipper chip fitted to this model."

To: Richard Baguley, Editor, Amiga Shopper
Address: RBaguley@Futurenet.co.uk

"Dear Friend:

Thank you for writing to the Vice President via Internet. This Administration is committed to integrating this new medium into the White House, and we hope to begin responding electronically to your messages in the near future.

Unfortunately, the very large volume of mail received by the Vice President from citizens around the nation prevents him from sending a more detailed and direct response at this time.

Please be assured, however, that your correspondence has been read carefully, and a detailed report of the mail is provided to the Vice President on a regular basis. Your message will be brought to his attention as a part of that report.

Since there has been a steady increase in mail to the Vice President, your help will be needed to ensure that we can read and record your message clearly. Please try to write short and concise messages, address only one issue per message, and send only one copy of your message.

We are pleased to announce the Internet address for obtaining White House documents and publications. The address is:

publications@whitehouse.gov

To receive instructions for obtaining documents, please send a request to the above address. In the body of the message, type "Send Info" (without quotes); no other text is necessary. The instructions will be sent to you automatically. By following these instructions, you should be able to search for and receive documents within a matter of minutes.

Thank you for taking the time to message the Vice President and for your patience as we fine-tune the response system. On behalf of the Vice President, I also want to thank you for your continued support and for your participation in our democratic system of government.

Sincerely,

Bill Mason
Director of Vice Presidential Correspondence

to see anything on the CD^{32}, except for a couple in the 'ACAR' magazine, is typical. To see the machines and other peripherals being advertised as they are in Europe is enough to make you cry!

Mr Bronte DG Allan
South Australia

I think that the lack of Commodore advertising in Australia has something to do with the fact that Commodore International have gone bust, and the fact that the Australian branch of Commodore closed down some time ago. When your parent company goes into liquidation, advertising tends to fairly low on your list of priorities. David Pleasance has said that he will be concentrating on "core markets" (such as the UK and Europe) initially, although he is also planning to appoint sole distributors in other countries. Hopefully, these distributors may consider doing some advertising in the near future.

I agree with you about the importance of markets such as education. Early indications are that the new Commodore will be changing the marketing of the Amiga, emphasising it as a family computer.

CRUDDY COMMODORE?

I'm not a common user – most time that I spend with my computer I'm programming. I understand hardware a bit (thanks to a university course) and I know quite a lot about both Amiga and PC programs.

Thanks to the university I have access to Internet and for almost two years I was reading a lot of stuff like "Amiga is Great, but Commodore is Bastard", so it wasn't a big surprise for me when I saw Commodore going into liquidation.

The liquidation of Commodore International is near the end and Commodore UK could be the buyer. I would be quite glad if it's them because they will continue the Amiga family – others may just use the technology for their products, letting the Amiga die. For any buyer wanting to continue the Amiga line I have a few of my personal tips:

● Hardware – Of course the first thing to do is start producing current Amigas again. But then they should look at the computer market. They will see that there is one very popular model notebook. It's important to be able to take your computer with you and work nearly anywhere without a plug. So, in my opinion, by the end of the year there should be an Amiga notebook.

Then there should be a new model of the A1200. Nothing too special, but at least with MC68030 (if possible with MMU – the 25MHz model is not so expensive and it is enough for a low machine), 4Mb RAM and a place for 3.5" hard disk (that will lower the prices of HD-based Amigas). High-density floppy would be nice, but it is not necessary here.

As for the CD^{32} it should be developed well, because it's the money-earning machine now and the money can be used to improve the Amiga.

I also think new Amiga models should get names instead of numbers.

● Software – The biggest task for a new Amiga manufacturer is the operating system. All other software projects should be left, frozen or sold and all programmers should be forced to make a new great version of Amiga DOS. There's quite a lot to do. Andy Braybrook is right in his article in the latest issue of *Amiga Shopper*. There are a lot of features but it is too complicated to use them.

There should be a library for easy GUI handling (like Magic User Interface, just MUI is mainly based on pointers and it doesn't have to be), better tag list system (now you waste from 2 to 6 bytes for each information), compression built-in filesystem (XPK would be great – different methods on different files is a perfect idea), etc. There's a lot to do, and I think it's important that MMU usage is built in the system (both virtual memory and program fail protection included).

Also software developers should be well supported to make some good quality impressive programs like MS Word, Lotus Improv, Corel Draw! etc. The Amiga has the power to support these programs. Impressing the computer world with a quality operating system and competitive (and cheaper) software would be a good step forward for the Amiga.

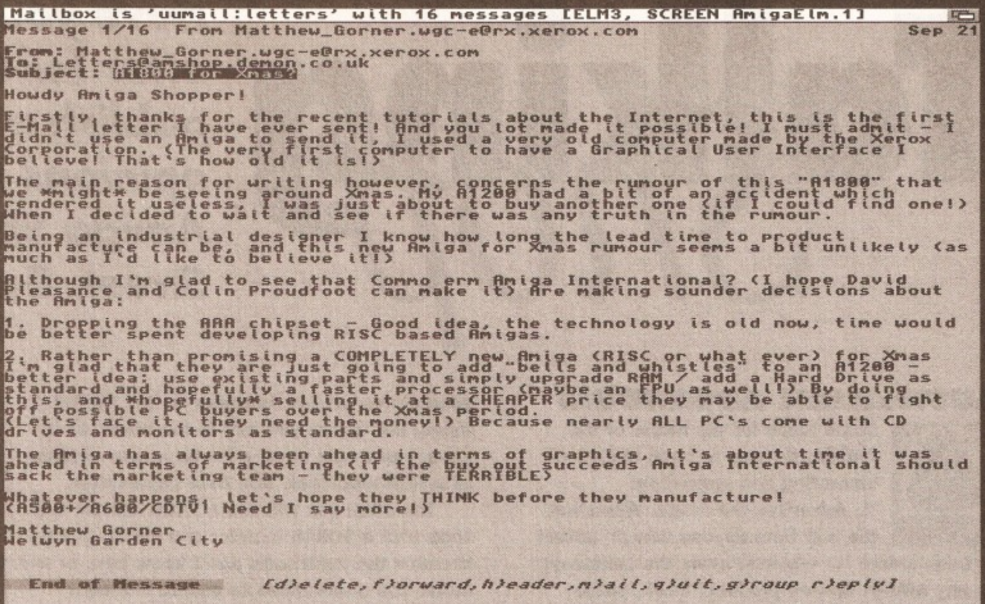
Jan Skypala
Czech Republic

Some interesting ideas there, Jan. I certainly agree that the first step in bringing the Amiga back has to be producing the current models in quantity and getting them into the shops, but technology moves on at a truly unnerving pace, and the Amiga should be no exception to this rule. New developments are what keeps a machine going in our incredibly competitive computer market, and the Amiga has been standing still for too long.

WANTED: AMIGA GENIUS

Are you interesting? If not, do you at least use your Amiga in an unusual and exciting way... or in *any* vaguely interesting manner for that matter? If so, we want to hear all about it – we may even interview you and devote you and your pet Amiga a full page in the magazine.

Hey guys and girls, we offer you fame and stardom... and if your project is of particular genius, we will reward your talent in a very special way.


Mailbox is 'uumail:letters' with 16 messages [ELM3, SCREEN AmigaElm.1]
Message 1/16 From Matthew_Gorner.wgc-e@rx.xerox.com Sep 21

From: Matthew_Gorner.wgc-e@rx.xerox.com
To: Letters@amshop.demon.co.uk
Subject: A1800 for Xmas?

Howdy Amiga Shopper!

Firstly, thanks for the recent tutorials about the Internet, this is the first E-Mail letter I have ever sent! And you lot made it possible! I must admit - I didn't use an Amiga to send it, I used a very old computer made by the Xerox Corporation. (The very first computer to have a Graphical User Interface I believe! That's how old it is!)

The main reason for writing however, concerns the rumour of this "A1800" that we *might* be seeing around Xmas. My A1200 had a bit of an accident which rendered it useless, I was just about to buy another one (if I could find one!) When I decided to wait and see if there was any truth in the rumour.

Being an industrial designer I know how long the lead time to product manufacture can be, and this new Amiga for Xmas rumour seems a bit unlikely (as much as I'd like to believe it!)

Although I'm glad to see that Commo erm Amiga International? (I hope David Pleasance and Colin Proudfoot can make it) Are making sounder decisions about the Amiga:

1. Dropping the AAA chipset - Good idea, the technology is old now, time would be better spent developing RISC based Amigas.

2. Rather than promising a COMPLETELY new Amiga (RISC or what ever) for Xmas I'm glad that they are just going to add "bells and whistles" to an A1200 - better idea: use existing parts and simply upgrade RAM / add a Hard Drive as standard and hopefully a faster processor (maybe an FPU as well!) By doing this, and *hopefully* selling it at a CHEAPER price they may be able to fight off possible PC buyers over the Xmas period.
(Let's face it, they need the money!) Because nearly ALL PC's come with CD drives and monitors as standard.

The Amiga has always been ahead in terms of graphics, it's about time it was ahead in terms of marketing (if the buy out succeeds Amiga International should sack the marketing team - they were TERRIBLE)

Whatever happens, let's hope they THINK before they manufacture!
(A500+/A600/CDTV! Need I say more!)

Matthew Gorner
Welwyn Garden City

End of Message [d)elete, f)orward, h)eader, m)ail, q)uit, g)roup r)eply]

Just to prove it happens, here's a letter we received via the Internet. See "Eh! Where's my A1800!".

SALUT, SHOPPER!

Thanks for the book with AS42. I'm a relatively new user, as I am sure that thousands of other new entrants to universities realise that they are too. Now I'm here, I'm really looking for contacts, and that book was superb as a starting guide.

Chris Benton.
Somewhere on the Internet

Good stuff. The book was, as you say, intended only as a starting guide and an indication of the range of things which are available on the Internet. Keep looking, and I'm sure you will find many strange and wonderful things on the network.

EH! WHERE'S MY A1800!

Firstly, thanks for the recent tutorials about the Internet, this is the first E-Mail letter I have ever sent! And you lot made it possible! I must admit I didn't use an Amiga to send it – I used a very old computer made by the Xerox Corporation. (The very first computer to have a Graphical User Interface, I believe – that's how old it is!)

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"The Amiga is great, but Commodore is bastard."

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The Amiga has always been ahead in terms of graphics, it's about time it was ahead in terms of marketing (if the buy-out succeeds, Amiga International should sack the marketing team – they were *terrible*).

Whatever happens, let's hope they *think* before they manufacture!

Matthew Gorner
Welwyn Garden City

I agree with you about the proposed A1800. Given that the manufacture of new Amigas has only just started, I would imagine that the new Commodore will be more interested in getting the existing models (the CD32, A1200 and A4000) into the shops first. Designing and manufacturing new models of computer is an extremely expensive business, and I very much doubt that the new Commodore will be able to afford to put out any new models for a good few months.

However, I don't doubt that the A1800 and various other possible models exist somewhere in prototype form. After all, it's the purpose of Research and Development teams to come up with new chips and computers and the Marketing Department to decide whether these are viable. For instance, I know that a prototype AGA Zorro III card was produced by Commodore engineers, which would have turned an A3000 into an AGA machine. However, Commodore decided not to produce this as a full product, as the figured that they would rather have people buying a new Amiga than a single card.

INTERESTING INTERNET

First of all, about that Internet booklet. There are two WWW pages which should have been mentioned there. I'm not sure if they weren't mentioned because this was just a preview to the book, or because you don't know about them, so here they are... Well, not. For some reason I can't access them now. Anyway, here's where one should have been:

The Monty Python page: http://alfred.u.washington.edu:8080/~uffda/python.html

There was also the Star Trek – TNG page, but I don't have its address. It should be accessible from the following page of links: http://alfred.u.washington.edu:8080/~uffda/links.html

Okay, back to the mag. That A1200 accelerator test feature was nice. One thing I found interesting was the FMatrix and CplxTest tests which didn't seem to use the FPU much. They do lower the average considerably.

As to the FreshFish review, I agree that such a disc is not everyone's cup of tee (or bottle of beer). Still, it's quite good for developers, and for university CS students, or others who work with GCC. GCC may actually be the best C++ compiler for the Amiga, and although it may be resource hungry, it doesn't cost anything. For other Fish stuff, it's probably best to get the FrozenFish discs. (And the GoldFish disc set with the full Fish 1-1000 library.) Followers of Amiga Usenet groups will also remember that Fred Fish has decided to remove the boot code (which was on early FreshFish discs), in order to save money (the C= license) and because the nature of the disc means that it's unlikely to be all that useful on its own. You also promised a CPDP4 review, on that page, somewhere in the issue (though I can't find the reference this minute). Where did it go?

"Let's hope they think before they manufacture."

About using KS1.2 with WB1.3 – that's the way it should be done. The upgrade was designed like this (no ROM sold originally), as the difference is between KS1.2 and KS1.3 is the autoboot code. That's why there's no reason for most programs (that do not depend on the autoboot code) to demand KS1.3 and not KS1.2. Anyway, I'm planning to buy an A1200 in a few months time, once I have some more money.

As to Mein Kampf – yes, silly me. I did hear that it was boring in the past, which is probably why I didn't read it. I could recommend Ralph Giordano's book "What if Hitler won the war" (that's a loose translation – I read it in Hebrew, and the original title is in German), though. It's fascinating as it details the Nazis' plans into the far future. I'm sorry that I won't be able to attend the FES. If I had enough money to go to the show, I would probably have bought an A1200. Then again, will there be any free beer and sex at the show?

Eyal Teler
Israel

I dunno about the free beer, but you did miss your chance to kiss Nick Veitch (consultant editor of *Amiga Format*) at the FES. Whether this is a good or a bad thing I leave to your imagination.

We didn't mention the pages you refer to because of space. The book on the cover was intended to act as a taster for what sort of thing is available on the Internet. We couldn't hope to print a guide to every WWW page, as this would take up several issues of *Amiga Shopper* and would be out of date by the time we printed it. The Monty Python page seems to be working all right and the Star Trek: the Next Generation page can be accessed directly at **http://www.ugcs.caltec.edu/~werdna/sttng** Incidentally, there is also a rather good Red Dwarf WWW Page at **http2.brunel.ac.uk:8080/red_dwarf/home.html** and a link into the on-line version of Bruce Sterling's excellent book "The Hacker Crackdown" from the WWW page you mention.

I'm glad you liked the A1200 accelerators and RAM card round-up. We decided to give a range of figures as we felt that these would give a better overall impression than a single figure, as different cards often perform better in certain areas than others. This is particularly true when you are dealing with accelerator cards which run at different speeds and have different types of FPUs on board.

Personally, I think the final word in alternate histories of the second world war has to be Phillip K Dicks excellent "The Man in the High Castle", but I'm not quite sure what this has got to do with Amigas, so I'll shut up. AS



Want to check out the Monty Python home page? See "INTERESTING INTERNET".

A LETTER A DAY HELPS YOU WORK, REST AND PLAY

It can also get you £25. Here at *Amiga Shopper* we don't just give you facts, figures and thick, thick tutorials. We also give you money. Every month, we reward the finest, most chocolaty letter with a £25 voucher which can be used to buy any form of heavily sugared comestibles. Of course, we don't want to rot your teeth, so here are a list of things that we like to talk about whilst chewing on a candy bar:

- **The new Commodore**
- **New Models of Amiga**
- **Interesting and unusual uses for your Amiga**
- **The meaning of life.**
- **The purpose of human existence**

CONTACTING THE TALKING SHOP

To add your contribution to any of the debates going on in this page send your letters to :

Talking Shop
Amiga Shopper
30 Monmouth St
Bath
Avon BA1 2BW

Alternatively, you can E-Mail them to :

Letters@Amshop.demon.co.uk (Internet)
2:2502/129.1 (FidoNet)
240:370/0.50 (MercuryNet)

All letters received at these addresses will be considered for publication unless you specifically advise us otherwise.

Find your local group

Your at-a-glance guide to every Amiga user group in the world.

SOUTHEAST & EAST

Addlestone 1–1 Amiga Club. Contact Peter Duckett ☎ 0932 855834 after 8pm.

Ashford Kent Youth Computer Group. Contact Jim Fanning ☎ 0233 629804.

Banstead Limited Edition Software. Contact Les, 28 Congcroft Avenue, Banstead, Surrey SM7 3AE.

Beccles Waveney Amiga (WAM). Contact Stephen Cockerell ☎ (0502) 711 888. 10 Hillcrest Close, Worlingham, Beccles, Suffolk NR34 7BY.

Bedford Nemesis Amiga Group, Andy Melbourne, (0234) 350654, 126 Mallard Hill, Bedford, MK41 7QT.

Brentwood Hermit Computer Club. Contact John Maynard ☎ 0277 218897.

Brighton Hanover Computer Club. Contact Colin Jones ☎ 0273 602834.

Bromley ICPUG South East. Contact Ien Beard ☎ 0689 830 934.

Bromtard Better Than Life. Contact Mark Waters, 7 Linton Downs, Brotard, Herefordshire HR7 4QT.

Camberley Camberley User Group. Contact F Wellbelove ☎ 0252 871545.

Cambridge Cambridge Sixty-Eight Group (CASE). Contact EPL Rowell ☎ 0954 210692.

Chesham Beaconsfield and District CC. Contact Philip Lishman ☎ 0494 782 298.

Clacton Cheapo PD Club. Contact Jason Meachen, Ivy Cottage, Chapel Road, Beaumont, Clacton, Essex C016 0AR.

Coulsdon The Crumblies. Contact Frank Barron ☎ 081 668 7695

Enfield Enfield Amiga Club. Contact Sean Clifton ☎ 081 8042867

Folkestone Amiga 101. Contact D Cryer ☎ 0303 245 378.

Gerrards Cross Chic Computer Club. Contact Steve Winter ☎ 0753 884473.

Hastings Computer Club. Contact ☎ 0424 421480.

Horsham Amiga Zone. Contact Gareth and Raymond, 7 Swindon Road, Horsham, W. Sussex RH12 2HE.

Ipswich Not the Night. Contact Andrew, 8 Lanark Road, Ipswich IP4 3EH.

Leigh-on-Sea Sensible. Contact M Street, 158 Hadleigh Road, Leigh-on-Sea, Essex SS9 2LP.

Leigh-on-Sea The Swop Shop Club. Contact Ian Prentice ☎ 0702 710267.

London (East Ham) Amigaholics Club. Contact Kevin Bryan ☎ 071-580 2000 Ext 240.

London (Hampstead Garden Suburb) Amiga Club. Contact Imp ☎ 081 455 1626.

London (Winchmore Hill) Access Information Technology.Contact Darren ☎ 0956 229729.

London PD for beginners. Contact M.Macias ☎ 071/924/5528 before 6pm. 14 Totteridge House, 15 Yelverton Road, London , SW11 3QQ.

London Twilight. Contact 13 Mavis Court, Ravens Close, London NW9 5BH.

Luton, Plague Amiga Users Group. Contact Russel Lewis 0582 484 514. 44 Moreton Rd. North, Luton LU2 9DP.

Luton Amiga Users Group. Contact Dave ☎ 0582 481952.

Mundesley APDEG (Amiga Public Domain Exchange Group).Contact Richard Brown ☎ 0263 720868.

Norwich AGA Exchange. Contact K. Phillips, 18 Brownshill, Cromer, Norwich NR27 0QA.

Norwich Magic Windows. Contact Frame, 26 St Benets Road, Stalham, Norwich, NR12 9DN.

Romford Digital Disk Amiga. Contact David Cowell ☎ 081 590 2546.

Rye Rye Amiga Group. Contact Oliver Campion ☎ 0797 222876.

Sittingbourne Sittingbourne Co-op Amiga Club. Contact Andy ☎ 0795 842 608. The Bungalow, Keycol Hill, Newington, Sittingbourne, Kent ME9 8NA. Postal memberships offered. Support BBS ☎ 081 905 7002 (data).

Southampton Blitz programming Club. Contact mr D Collins, 6 Bentley Green, Southampton S018 5GB.

Southend-on-Sea Southend Team. Contact ☎ 0702 333974.

Sutton Agnus. Contact Philip Worrel, 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW.

Stockdale Amiga Owners Society. Jim & Wayne, (0304) 380670 + (0304) 362297, 100 Stockdale Gardens, Deal, Kent, CF14 9BN.

Thetford Bizart Diskmag. Contact Stephen Marghan, Timberton House, The Mount, Buckenham Tofts, Thetford, IP26 5HP.

Thornton Heath AmigaBASIC club. Contact: Imran Ahmad ☎ 081 689 9102.

Watford Hertfordshire Amiga Users Group. Contact Keith Alexander ☎ 081 421 1784.

West Watford AmigaSoc. Contact Neil Cartwright ☎ 0923 248483.

Windlesham Ninja Software PD. Contact Gary Bowen (0276) 479615, 11 Hutton Close, Thorn-down Lane, Windlesham, Surrey, GU20 6DN.

Witham Amiga Witham Users Group. Contact K Anderson ☎ 0376 518271.

Worthing Imagine, Lightwave, Real 3D objects. Contact Michael Moorfield, 4 St Botolphs Crt, St Botolphs Rd, Worthing, West Sussex BN11 4JH.

Yarmouth Robotronix Amiga Club. Contact P Symonds ☎ 0493 667161

SOUTHWEST

Bodmin Amiga Users Klub (Bodmin). Contact Jack Talling, 1 Windsor House, 19 Castle St, Bodmin, Cornwall PL31 2DX.

Bournemouth Amiga Club. Contact P Chamberlain ☎ 0202 296714.

Bristol Avon Micro Computer Club. Contact Roger or Bob ☎ or Fax 0272 311642.

Bristol Bristol Amiga Club. Contact 3 Parkstone Avenue, Horfield, Bristol BS7 0BX.

Bristol EmuSoft. Contact Nalpex, 48 Longhandstones, Cadbury Heath, Bristol BS15 5AP.

Dukinfield C.C. Swapshop. Contact Tom Hampson ☎ 061 339 9488.

Exeter Exeter 16-bit User Group. Contact Andrew Deeley/Phil Treby at 25A Gloucestershire Rd, Exwick, Exeter, EX4 2EF.

London PD for beginners. contact M.Macias ☎ 071/924/5528 before 6pm. 14 Totteridge House, 15 Yelverton Rd, London ,SW11 3QQ.

Reading Charlies PD. Contact Charles Read, 10 The Cedars, Tilehurst, Reading, Berks RG3 6JW.

Salisbury CHUD. Contact Mr M Sellars ☎ 0980 33154.

Taunton Imagine Object Makers. Contact Charles Mo, 16 Calder Crescent, Taunton, Somerset TA1 2NH.

Torquay Ami-Info. Contact Paul Caparn, Homeside, Higher Warberry Road, Torquay, Devon TQ1 1SF.

MIDLANDS

Birmingham 68000 in Birmingham. Contact Mike Bedford–White, 16 Westfield Rd. Acocks Green, B'ham B27 7TL.

Birmingham Software Exchange Service. Contact Michael Pun ☎ 021 459 7576.

Coventry Coventry and Warks Commodore Computer Club. Contact Will Light ☎ 0203 413511.

Derby Living Poets Society. Publication and appraisal of creative writing. Sean Woodward. Fido 2:2503/104; 11. Menin Road, Allestree, Derby,DE22 ZNL, UK.

Hereford Hereford Amiga Group Help. Contact John Macdonald ☎ 0981 21414.

Leicester NFA. Contact NFA Productions (0533) 661 610. PO Box 323, Cambell St. Leicester.

Loughborough Leicestershire Amiga Users, Contact Daz or Eddy ☎ 0533 375 147 or (0509) 267 198. PO Box 10, Mountsorrel, Loughborough, Leicestershire LE12 7ZZ

Loughborough BR & CJ Computer Club. Contact B Robinson ☎ 0392 72889 or ☎ 03922 841296.

Melton Mowbray Melton Amiga Users. Contact Stephen Mowbray ☎ 0664 63421.

Nottingham Robin Hood Amiga Users. Contact Kristian Denman (0777) 838 248. 2 Beech Walk, Elkesley Nr Retford, Notts DN22 8BB.

Nottingham East Midlands Amiga User Group. Contact Richard Haythorn ☎ 0602 298075.

Solihull Deluxe Cheats Disk User Group. Contact Steven Frew, 96 Campden Green, Solihull, West Midlands B92 8HG.

Solihull Sid The Kid Amiga. Contact Sid Reeves, ☎ 021 705 8619.

Solihull Solihull Computer Users Group. Contact Rich or Lee, 41 Leafield Road, Solihull, W. Midlands B92 8NZ.

Stoke-on-Trent The Amiga Studio. Contact Dave Rose (0782) 815 589, 25 Zodiac Drive, Chell, Stoke-on-Trent, Staffordshire, Midlands ST6 6NJ

Stoke-on-Trent ANDY PD contact Andrew Shufflebotham ☎ (0782) 775014, 2 Sussex Drive, Kidsgrove, StokeonTrent, Staffs, ST7 1HG.

Sutton-on-Sea Aden PD. Contact Den Rounding, 8 Primrose Lane, Miami Beach, Trusthorpe Road, Sutton-on-Sea, Lincolnshire LN12 2JZ.

Telford Shropshire Amiga Link. Contact N Cockayne ☎ 0952 591376.

Telford West Midlands Amiga Club. Contact Kevin Genner Telford Snooker Centre, Canongate, Oakengates, Telford, Shropshire.

Witney Cacophony (Unlimited). Contact Mark Wickson, 49 Perrott Close, North Leigh, Witney, Oxon OX8 6RU.

NORTHEAST

Balby Warpdrive. Contact B Scales ☎ 0302 859715.

Barnard Castle Amiga Users' Club. Contact Paul Kellett 67 Green Lane, Barnard Castle, County Durham DL12 8LF

Barnsley Access Amiga User Club. Contact Mark Grimshaw, 20 Lilydene Ave, Grimethorpe, Barnsley, South Yorkshire S72 7AA.

Barnsley Amiga Programmers' User Group. Contact Andrew Postill, 2 Selby Road, Newlodge, Barnsley, South Yorkshire S71 1TA.

Catterick Champion PD Club. Contact Steve Pickett, 31 Somerset Close, Catterick, N Yorkshire DL9 3HE.

Chester-le-Street Chester-le-Street 16-Bit Computer Club. Contact Peter Mears ☎ 091 385 2939.

Darlington Darlington Commodore Users Club. Contact Steve Wheatley, 1 Ruby St, Darlington, Co Durham DL3 0EN.

Darlington Jemsoft Amiga Users. Contact Danwood, 3 Cavendish Drive, Darlington, Co Durham DL1 2GQ.

Darlington National Amiga Users Group. Contact Membership Secretary, PO Box 151, Darlington, County Durham DL3 8YT. ☎ 0325 352260

Durham The Amiga Club. Contact G Starling, 31 Pine Lea, Brandon, Durham DH7 8SR.

Harrogate Club 68000. Contact Chris Hughes ☎ 0423 891910.

Houghton-le-Spring Club Amiga. Contact Chris Longley, 5 Bowes Lea, Shiney Row, Houghton Le Spring, Tyne and Wear.

Keighley Pennine Amiga Club. Contact Neville Armstrong ☎ 0535 609263.

Mickley Nothing But AMOS Monthly disk magazine. Contact Neil Wright ☎ 0661 842292.

North Berwick East Lothian Amiga Group. Contact Mr J Curry ☎ 0620 2173.

Otely Harley's PD Swaperama. Contact G Varney ☎ 0943 466896.

Rotherham Software City. Contact N Richards ☎ 0709 526092.

Sheffield Steel PD. Contact James Whitehead, 33 Middle Cliffe, Drive Crowedge, Sheffield S30 5HB.

Spalding TDM. Contact Gedney Marsh, Spalding, Lincolnshire.

Stocksfield Blitz User Group. contact Neil Wright, 39 Riding Dene, Mickley Square, Stocksfield, Northumber-land, NE43 7DL.

Sunderland Blitter. Contact Philip Kruman, 213 Fordfield Rd, Sunderland SR4 0HF.

Sutton-on-Sea Aden PD Club. Contact Den Rounding, 8 Primrose Lane, Miami Beach, Trusthorpe Road, Sutton-on-sea, Lincs LN12 2J2.

Tunstall The Amiga Studio. Contact Dave Rose ☎ 0782 815589.

Washington Mainly Amiga. Contact Ray Scott ☎ 416 9189.

Whiteley Bay Club Futura. Contact G Holland, 16 Hermiston, Monkseaton, Whitley Bay, Tyne and Wear NE25 9AN.

NORTHWEST

Accrington New Hall Amiga Users Club. Contact Bill Grundy ☎ 0254 385365.

Blackburn Blackburn Amiga Users Group. Contact Eric Hayes ☎ 0254 675625.

Blackpool Channel Z Diskmag. Contact Darren Busby, 3 Edelston Rd, Blackpool FY1 3HN.

Fleetwood Fylde Computer Club. Contact Colin Biss ☎ 0253 772502.

Lytham St Annes Amiga Users Group Part 2. Contact Andy Wilkinson ☎ 0253 724607.

Macclesfield Computer Club (Est 1983). Contact D. Latham (chairman) ☎ (0625) 615 379, Fax: (0625) 429 667. c/o Grantham House, Macclesfield, Cheshire SK10 8NP.

Oswaldtwistle Hyndburn Amiga Users Club. Contact Nigel Rigby ☎ 0254 395289.

Skelmersdale Computeque. Contact Steve Lalley ☎ 0695 31378.

Stamford Under 18 Only. Contact Joe Locker ☎ 0780 64388

SCOTLAND

Angus Amiga CDTV club. Contact James Robertson ☎ 0356 623078, 22A High St, Brechin.

Bathgate Lothian Amiga Users Group. Contact Andrew Mackie, 52 Birniehill Ave, Bathgate, W Lothian EH48 2RR.

Cowdenbeatrh Amiga FX. Contact Ryan Dow ☎ 0383 511 258.

C.P.C. User Group, Alistair Lyons, 18 Braehead, Bo'ness, West Lothian, Scotland, EH51 9DN.

Dundee Tay-Soft PD Club. Contact Dave Thornton ☎ 0382 505437.

Dunfermline Dunfermline Sound & Vision Club. Contact Stan Reed, 7 Maxton Place, Rosyth, Dunfermline, Fife KY11 2DG.

East Lothian Amiga Club (every 2nd week). Derek Scott ☎ 0620 823137, (Saturday 1 – 4pm). Bridge Centre, Poldrate, Haddington, East Lothian, Scotland.

Edinburgh Edinburgh Amiga Club. Contact Stephen Fradley ☎ 031 555 1142.

Edinburgh Edinburgh Amiga Group. Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh EH14 2DE.

Glasgow Amiga Helpline. Contact Gordon Keenan, Amiga Helpline, 6 Skirsa Square, Glasgow G23.

Hawick Borders Teri Odin BBS. Derek Scott, 0450 373071. 26d Harden Place, Hawick, Borders, Scotland.

Inverness Highland PD.Contact David Paulin ☎ 0463 242431.)

Johnstone Using AMOS. Contact Colin McAllister ☎ 0505 331342.

Perth Perth and District Amateur Computer Society. Contact Alastair MacPherson 137 Glasgow Rd, Perth.

Redburn Redburn Computer Users Group. Contact Ruby Anderson ☎ 0294 313624.

W. Lothian Amiga Computer User Club. Contact Alistair Lyons, 18 Braehead, Bo'ness, W. Lothian, Scotland EH51 9DN.

WALES

Bangor Amiga Maniacs. Contact Johnny, 8 Tan-y-Grais, Caernarfon Rd, Bangor LL57 4SD.

Carmarthen Bloomfield Video and Computing. Contact Mrs Beryl Hughes ☎ 0267 237522.

Clwyd ShieldSoft PD. Write to 26 Doren Avenue, Rhyl, Clwyd LL18 4LE, ☎ 0745 134 3044.

Clwyd Solo (Amiga). Contact

Mike, 26 Doren Avenue, Rhyl, Clwyd LU8 4LE. ☎ 0745 343044

Neath Amiga Navigation. Contact Dave Thomas 4a, Allister St, Neath, W Glamorgan.)

Powys Blue Bedlam. Contact Michael Grant ☎ 0873 811791.

N IRELAND

N Ireland N. Ireland Amiga User. Contact Stephen Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS.

N Ireland Digital Intensity (diskmag). Contact Simon Denvir, 40 Old Cave Hill Rd, Belfast BT15 5GT.

BBSs

Amiga Buzz BBS. Contact David Clift on ☎ 0924 491 461.

Amiga Village BBS. Contact David Jones 01744 894 795.

Animeiga UK BBS Contact Chris Payne ☎ 0462 484 752 . 2400_14400 V32bis 8n1 24 hours a day/7 days a week.

Avenger BBS, Lincolnshire based board, opening times: Weekends 9pm 12am upto 14400 baud, Data ☎ (0507) 568318.

Bidwell BBS. Contact SYSOP Mark Lunt Modem ☎ 0582 863 906.

Birmingham The Junction Box BBS. Contact mark Pegler ☎ 021 321 2235.

Borders Teri-Odin BBS. Contact Derek Scott ☎ 0450 373 071.

Chiltern Amigas BBS, contact Commodore Specialists ☎ (0296) 87522. 14400BPS, 37 Plough Close, Aylesbury, Bucks, HP21 9AD.

Cumbria (Barrow-in-Furness) The Power Plant BBS. Contact Neal Postlethwaite ☎ 0229 431590.

Dark Solution BBS. Sysop Andy Miller (0246) 277317. 24 hours a day,(300 14400 Bps). friendly sysop Loads of files.

Den's Den BBS. contact Sysop Dennis Luckett (0702) 464818, SouthendonSea, Essex.

DOZ BBS (Leics area) Amiga Only. SYSOP (0533) 461 665 from 6pm – 12am.

Enigma BBS – MAXnet, Internet access, online Amiga help, speeds up to 14400 ☎ (0275) 541 418 8pm–8am

The Ethereal Cereal BBS, SYSOP the Pongmaster. BBS 0707 275567 24hrs.

Ethos BBS, Contact Steve Bell ☎ 0924 437 258. 24 hours, 14400 Band.

Frost Free BBS, Dave Naylor, ☎ (0484) 842341 (DATA), Amiga specific BBS, all speeds up to 14400, online CD ROMS - online 24 hours.

Glasgow Action Replay Users Club. Contact Gordon Hagan, 66 Muirside Avenue, Kirkintilloch, Glasgow G66 3PR.

Guru Mediation BBS! 24 hours. Call 24 hours v.32bis on BBS +44 (0) 81 401 2502. CD-ROMs/Kewl Ansi. Call now or regret it!

Highlander BBS. Contact Alan Walker, Mark Price ☎ 0452 384702 & ☎ 0452 384557.

Impulse BBS. Contact James Norris ☎ 081 698 8978.

Lincolnshire Avenger BBS, Lincolnshire based, all speeds to 14400 V32 bis. 10pm - midnight. Also Saturday 9pm - midnight and Sunday 9pm - midnight. Call ☎ (0507) 568318.

Liverpool Nickelodeon BBS. Contact SYSOPS Mark Williams, Tony Ross ☎ 051 709 8508 (Liverpool).

London On-Line Network BBS. Contact ☎ 081 539 6763 (London).

Look Northwest BBS. Contact ☎ 0282 698380 or ☎ 0282 619518.

Night Owls BBS 24 hours. Sysop, Andrew Hartley, BBS ☎(0296) 632019.

Plymouth Pilgrims BBS. Contact Jon Wickett ☎ 0752 366 939.

Sysop Auto Pilot BBS. New BBS, Amiga only. Wednesday Evenings from 7pm, all weekend. Generous ratio's for first 50 callers! Sysop, Gavin Dolphin, ☎ 0332 660768.

Sysop Frontier, Mathew Recardo. ☎ 0527 597531.

System One BBS. Contact ☎ 0743 791501.

The Cartoon BBS. Contact the Bartman ☎ 071 635 0592.

The Loft BBS. contact sysop crispy (24 hours, 14.4k) (0203) 545320.

The Neutral Zone (Star Trek BBS). contact Arklight or Gul-Ducat, Dunstable ☎ (0582) 475032. Dennis Luckett ☎ (0702) 464818, Southend-on-Sea, Essex.

The Power Station BBS. contact Sysop Alan Maylin & Neil Barrett, BBS (0375)640507.

The Trashcan BBS, Ian (Red Dog) Forest, ☎01 706 53024 (Data). Amiga only! All speeds to 14.4K - 10pm -7am, 7 days maxnet & maxlink mail - disabled file ratio for as readers!

Thetford CD BBS. Contact Paul Morris ☎ 0842 763639.

Trick or Treat II BBS. Contact Mark Meaney ☎ 0703 391 797.

Warlock BBS. Contact Mr Manglin ☎ 031 659 5806

Warrington The CDTV Revolution. Contact Lee Beckett ☎ 0925 268819.

Witzend BBS. Contact Darron Fooks (0702) 470 469, 109A Leigh Hall Rd, Leigh on Sea, Essex.

Worlingham Sliver BBS (10pm - 3am). Mat Tillett, 0502 715296. 27 Hillside Avenue, Worlingham, Beccles, NR34 7AJ.

SPECIAL INTERESTS

Amiga Sports Fans. Contact Jamie Last, York House, Church Road, Elmswell, Bury St Edmunds, Suffolk, IP30 9DY.

Angus Amiga Musicians Club. Contact Gavin Wylie, Guthrie Street, Carnoustie, Angus.

Basingstoke AMOS Programmers Exchange. Contact J Lanng, 7 Majestic Rd, Hatch Warren, Basingstoke, Hants RG22 4XD.

Branston Fen Amiga Boatowners. Contact D Beet Lock, Branston Fen, Lincolnshire LN3 5UN.

WHAT ARE YOU UP TO?

Here at Amiga Shopper we spend our days pondering on what you are all up to. Please set our minds at peace – write in and tell us about your user group. What do you do? Who is in it? Have you organised some special event/project lately? We are extremely nosy – we want to know everything, right down to the juicy details! We could make you the User Group of the Month and as such you will be awarded a very special (secret) price. **Get writing**

Braunston Nr Daventry GFA Basic Forum. Contact J Findlay ☎ 0788 891197

Braunston, Nr Daventry Amiga E Support Group. Contact John Findlay ☎ 0788 891197.

Broadstairs AMOS Programmer Club. Contact Gareth Downes-Powell, 6 Brassey Avenue, Broadstairs, Kent CT10 2DS.

Chelmsford Independent Commodore Products Users Group. Contact David Elliott ☎ 0245 328 737

Durham, Under 18 PD User Group (JB's PD). Contact J Blackburn, Longridge, Potters Bank, Durham DH1 3RR.

Glasgow 24-bit Club. Contact Gordon Keenan, 24-bit Club, 6 Skirsa Square, Floor 1, Glasgow G23.

Highfields CDTV User Group. Contact Gary Ogden, ☎ 0785 227059.

Lingfield In Touch Amiga. Contact P Allen, ☎ 0342 835530, PO Box 21, Lingfield, Surrey RH7 6YJ.

London (Richmond) Micro Academy. Contact Don Pavey ☎ 081 878 1075.

London Independent Commodore Products Users Group. Contact the Membership Secretary (Fax ☎ 081 651 3428). ☎ 081 651 5436

Lothian Independent Commodore Products Users Group. Contact David Hope ☎ 0555 811 955..

Macclesfield Independent Commodore Products Users Group. Contact Peter Richardson ☎ 0298 23644

Maidenhead Independent Commodore Products Users Group. Contact Mike Hatt ☎ 0753 645 728.

Manchester CDTV Users Club. Contact Julian Lavanini, 113 Fouracres Rd, Newall Green, Manchester M23 8ES.

New Whittington Digital Music Club. Contact Roger Hunt ☎ 0246 454280.

Normanton BASIC Programmers' Group. ContactMark Blackall ☎ 0924 892106.

Rochford Ray Tracers. Contact Neil Hallam, 12 Meesons Mead, Rochford, Essex SS4 1RN.

Romford Phoenix Demo. Contact Frank ☎ 081 597 4661.

Rotherham Marksman (Trojan Phazer user group). Contact David Green, 67 Thicket Drive, Maltby, Rotherham, S Yorkshire S66 7LB.

Solent Independent Commodore Products Users Group. Contact Anthony Dimmer ☎ 0705 254969

Swindon Amiga Video Producers' Group. Contact J Strutton ☎ 0793 870667 before 9pm.

Swindon MUG – MED Users Group. Contact Richard Bannister, 6 Glevum Rd, Stratton St Margaret, Swindon SN3 4AF.

Wallington Bible Bureau.Contact AD ☎ 081 669 7485.

Ware Gamer-Link. Contact Stu, 28 Churchfield, Ware, Herts SG12 0EP.

Witham Video Visuals. Contact Chris Brown, 4 Lavender Close, Witham, Essex CM8 2YG.

Workington AMOS Programmers Group. Contact John Mullen at 62 Lonssdale St, Workington, Cumbria CA14 2YD.

OVERSEAS

Australia Southern Suburbs Commodore Users Group, Steve Perry, P.O. Box 217, Beverley Hills 2209, Sydney, N.S.W. Australia.

Australia Amiga Users Group of Western Australia. Contact Bill Sharpe-Smith PO Box 595, Clover- dale WA 6105 Australia.

Australia Comp-U-Pal. Contact Comp-U-Pal, 116 Macarthur Street, Sale, Victoria 3850, Australia.

Belgium AUGFL vzw. Contact Lieven Lema, Meesberg 13, 3220 Holsbeek, Belgium.

Denmark Danish AMOS user group. Contact Tom Poulsen, DABG, postbox 127, 2640 Hedehusene, DK Denmark.

France 16-32 Micro. Contact F Moreau, 132 rue Jean Follain, 50000 Saint-Lo, France ☎ 315220 02.

France Maritime Amiga Club. Contact CDR K Osei, GN Ships Refit Office, 51 Rue de la Bretonniere, 50105 Cherbourg, France. ☎ 33 33225447.

Germany Royal Air Force Amiga Club. Contact Stan Young, HMF RAF Laarbruch, BFPO 43.

Germany Worldwide PD Club. Contact Dave White, Berliner Strasse 39, 40880 Ratingen, Germany ☎ 02102 499729 (Germany).

Greece Amiga Athens club. Contact Stefanos Papamichael, 9 Derfeld Rd, Patisia, 11144 Athens, Greece ☎ 01/2027973.

Greece Amiga Pros User Group Greece. Contact Stefanos Siopoulos, 52 Silivrias Str., N. Smyrni 17123, Athens, Greece, ☎ 01/9349963.

India Indian Amiga Friends. Contact Bilal, 46 Paragon 405 Lokhandwaza Complex, Andheri (W), Bombay-400058.

Ireland Amiga Addicts. For info SAE to A Minnock, Clonkelly, Binn, Co Offaly, Ireland.

Ireland AMOS Users.Contact Brian Bell, 8 Magnolia Park, Dunmurry, Belfast BT17 0DS.

Ireland City Centre Amiga Group. Contact Patrick Chapman, 70 Ballygall Crescent, Finglas East, Dublin II, Ireland, ☎ 345035.

Ireland CUGI Commodore Users Group of Ireland. Contact Geoffrey Reeves, c/o St Andrew's College, Booterstown Avenue, Blackrock, Co Dublin. ☎ +353 1 288 3863.

Ireland Navan Computer Club. Contact Mark Arnold, Cannistown, Navan, Co Meath, Eire ☎ 046 21078.

Ireland Northside Amiga Group. Contact William Kelling, 10/A Rainsford Avenue, Dublin 8, Ireland ☎ 01 532 807.

Ireland Software Exchange Club. Contact Michael Lacey, Fern's Post Office, Enniscorthy, Co. Wexford, Republic of Ireland.

Malta HTS (Malta). Contact K Cassar, Block 1 Flat, 6 H E Hal-Tmiem, Zejtun ZTN07 Malta ☎ 674023.

Malta Malta Amiga Club. Contact Zappor, PO Box 39, St Julians, Malta, ☎ 440453

Portugal. Centro Amiga/Via Lactea BBS, Rui Costa, 351 01 888 2245/49, Largo do Martim Moniz-C,C, Mouraria, 1 loja 408-1100 Lisboa, Portugal.

Portugal Software Asylum. Sid Sanches, Portugal ☎ 062 831566. Apartado 6156, 3000 Coimbra, Portugal.

Singapore Singapore Sling. Contact Eric Chai ML, Block 4 #14-413, Pandan Valley, Singapore 2159, ☎ 65 4680630.

South Africa Amiga Users Exchange (AUX). Contact Ken Turner, 24 Du Plessis Avenue, Edgemead, 7441 Cape Town, S. Africa. Internet: kturner@aztec.co.za

Sweden 32-bit ware. Contact 32-bit ware, Ekorrstigen 10, 147 63 Tumba, Sweden.

Switzerland Amiga User Group Switzerland (AUGS) Contact AUGS ☎ ++41 34 45 3078. Bahnhofstr. 7, CH–3426 Aefligen, Switzerland. BBS: +41 (0) 62 44 32 27. We have our own Net on several Swiss Amiga BBSs called "AUGS-Net".

USA Japan Amiga Group.Contact: Rick Gardaya, PSC 78 Box 3876, APO AP 96326 USA.

Note: this list is provided as a free service for amateur, non-profit-making user groups. Amiga Shopper does not endorse or recommend any particular group and cannot be held responsible for any possible losses.

SEND IN YOUR DETAILS!

***Amiga Shopper* wants a truly comprehensive list of all the Amiga user groups worldwide. If your user group isn't on this page, send the form to *Amiga Shopper* User Groups, 30 Monmouth Street, Bath BA1 2BW.**

USER GROUPS

AS44

GROUP NAME: ....

CONTACT NAME: ....

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CONTACT ADDRESS: ....

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- ☐ Overseas
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- ☐ ***UPDATED ENTRY***

SOFTWARE FOR FREE

Graeme Sandiford trips through the verdant fields of the PD world in search of yet more excellent PD and shareware programs.

We have certainly got a splendid selection of PD and shareware programs this month. We will be looking at an affordable alternative to buying more memory. We'll also be putting the two best PD image processors head-to-head, while sniggering at the comical antics of Charley Cat and his Japanese friends. If you've wanted to learn how to play chess, but had nobody to teach you, you'll be thrilled to hear that we're examining a computer chess teacher. We'll even be showing you how to spruce up your desktop and icons.

VMM (VIRTUAL MEMORY MANAGER)

Cynostic

If there is one thing that a serious Amiga-owner can never have too much of it's memory. However, memory is not cheap and as a result very few people can actually afford as much as they would truly like. There is an affordable alternative – virtual memory, and now, with VMM, it's become even cheaper.

The way in which virtual memory works is that it lets your machine use disk space as if it was memory. This can be performed using either a hard disk or a floppy. Obviously, a hard disk is preferable as it's quicker than a floppy – although slower than real memory. In fact, virtual memory is quite a bit slower than real memory.

By default, VMM creates a file the same size as the virtual memory you specify. To help speed things up, VMM can also use a partition or pseudo partition. A dedicated partition is the fattest option as you don't have to worry about fragmentation. However, if you don't want to go to the trouble of re-formatting your hard drive you can create a pseudo partition. The pseudo-partition is actually a folder of contiguous hard disk space. To get the largest size possible you may have to defrag your drive.

Once you have got the program up and running and your hard disk optimised, VMM's operation is pretty much transparent to the user. Virtual memory behaves in the same way as ordinary memory, even showing up in your Workbench's Other Memory total. Virtual memory can either be added to a program or a Workbench task. This way the virtual memory won't kick in, and slow down your machine, when it's not needed.

Adding a task or program is easy. To add a task you just click on the Add task button and a list of current tasks is opened. You can then select a task and then click on use. Adding a program is just as simple. After pressing the Add Program button you can use a standard file requester to select a program. The next time that program is run it will utilise the amount of virtual memory you have assigned to it.

> *"VMM is a program that is going to stay on my hard drive for a very long time."*

You can specify the amount of memory and other options from the Memory Settings menu. This where you can decide how the memory will be allocated and how it will be recognised by your system. You can use the virtual memory as either Fast or Chip RAM. You can also set the memories priority and its swap medium which, as mentioned earlier, can be a swap file, a partition or a pseudo-partition.

I must admit I had my reservations about this product, but it turned out to be pretty stable. The only problems I had was that sometimes when I quitted from VMM it crashed my machine. I've had it on my machine for nearly three weeks and have used it with Imagine 3.0, Pixel Pro 3D2 and LightWave regularly. Aside from Imagine barfing out a couple of times they all worked perfectly. The only drawback is that you need at an 030 processor with an MMU. This is a program that is going to stay on my hard disk for a very long time and if you are a subscriber you can add it to yours straight away, as it is on the subscribers' disk.

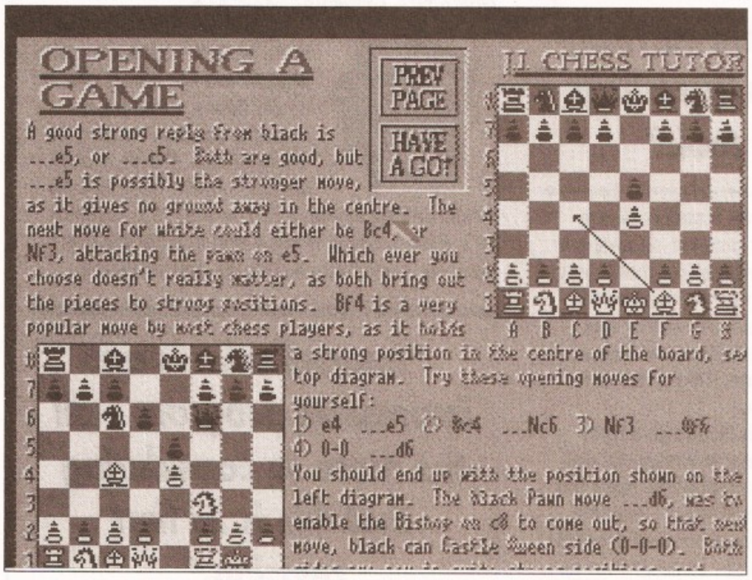
Program Rating 97%

J.I. CHESS TUTOR

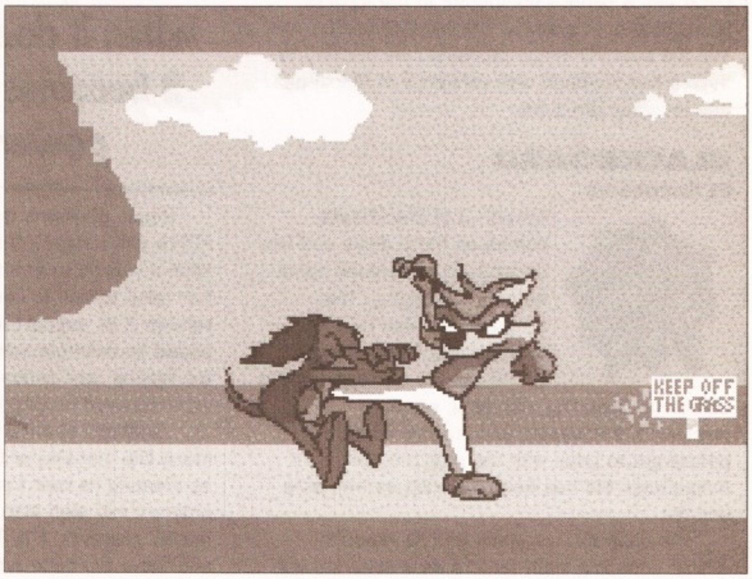
Cynostic

Chess is a great game. I've been playing it on and off since I was about 10, although I don't get much of a chance to play nowadays. It's a game that everyone should learn to play, but few actually take the time to find out the rules and get to grips with the strategies involved. The J.I. Chess tutor is an excellent way to learn if you don't enjoy reading books or have no one to teach you. It sets out to explain how to play this most excellent of board games.

The program uses a combination of text, diagrams and test situation to explain the rules and the strategies involved in playing chess. The tutorials are split into three main groups: the pieces, special moves, and tactics. There is also a main menu which contains an introduction to the



Is that the Scillian Defence? I hate it, it's always unnerving when your opponent plays that. Learn about the joys of chess with the J.I. Chess Tutor.



Here's a screengrab from Street Fighter VII Turbo Super Duper. Well, actually it's a scene from Charley Cat's latest adventure, Jap Cat Japes.

A BEGINNER'S GUIDE TO PD

It's all to easy to become confused in the PD world. You've got PD, shareware, licenseware and even whiskeyware. It's hard to know what all these phrases mean and what you are allowed to do with the software.

● The most common type of software you will find in the PD world is PD itself. This stands for Public Domain. PD is free and only a modest fee for disk duplication can be charged. It can be freely passed on to others as long as the documentation and the software remain unaltered.

● Shareware is intended to be of equal quality as commercial software, but gives you the chance to "try before you buy". The program is usually limited or disabled in some way and you have to register the software, by paying a fee, to get a fully working version. It's okay to pass unregistered shareware on, in fact that's what the author wants. However, you shouldn't pass on registered versions.

● Licenseware is software that is part way between the two. It's generally of better quality than PD, but, costs less than shareware. licenseware is like commercial software in as much as you just make one payment. The author receives a percentage of each copy sold It's illegal to distribute licenseware, yes even to your friends.

● As well as these three main types, you'll also encounter things such as giftware, whiskeyware and postcardware.

These are a request from the author, who's spent his/her time and effort, for you to send them a token of your appreciation.

game and explains the notation that's used throughout the rest of the tutorial.

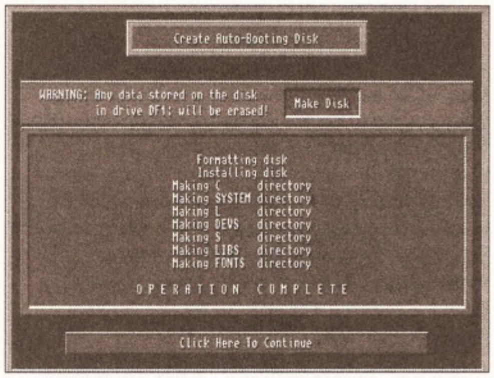
The pieces' tutorial takes you through moves the pieces can make and any special roles that they might play in the game. There are diagrams to help explain the way the piece moves. There are also example positions that indicate which squares the piece can move to in a given situation.

The special moves section takes you through special moves such as En Passant, check, checkmate and castling. This section also covers important basic strategies such as pins, forks, skewers and trapping, as well as slightly more complicated moves, such as the discovered attack and check. As with the other sections, diagrams and test scenarios are provided.

The Tactics tutorials gives you a basic understanding of important concepts you'll need to get to grips with. These include opening moves, capturing pieces, defending and the end game.

Although this package is unlikely to turn you into Gary Kasparov or your son into Bobby Fisher, it does serve as an excellent introduction to the game of chess. The only problem I found with the software was that it didn't respond to the moves I tried to indicate in the test scenarios.

Program Rating 84%



Create auto-booting in a matter of seconds with AutoBoot by Colin Yarnall. It does everything for you – just press the button.

JAP CAT JAPES (STARRING CHARLEY CAT)

Roberta Smith DTP (AW111 disks A-E)

It seems as if that Charley Cat fellow just can't stay out of trouble. After appearing in Coral Quarrel, reviewed last issue, Charley is making another appearance this month in Jap Cat Japes.

> **"This gives rise to plenty of good excuses for karate chops and kicks aplenty."**

This five disk animation is set in Charley's home town. It is centred around the arrival of a cat

IMAGE PROCESSORS HEAD-TO-HEAD

Image processing is definitely one of the most exciting and useful areas of computing. As a result there has been no shortage of programs for the Amiga, both commercial and PD. However, until recently, the PD world has only been able to offer some pretty wimpy specimens. Those of you with long memories might remember that an exception to this was reviewed in issue 37. BlackBoard has had it easy for some time now, but it has a serious competitor in the form of ImageStudio. In order to find out if BlackBoard is still the best PD image processor we decided to have a head-to-head with version 3 of BlackBoard and ImageStudio 1.01.

BLACKBOARD

F1 licenseware

Version 3 of BlackBoard comes on three disks and has supposedly undergone some serious de-bugging. The program has also become licenseware, now costing £5.99. All the old features are still there, including morphing, warping, pixellation, embossing and bulging. To help people get to grips with the program, an AmigaGuide file has been included as well as a text file.

The program has stuck with its modular design – loading each feature as a separate sub-program. This has its advantages and disadvantages. The main disadvantage is that you have to wait for sub-programs to load into memory. The good news is that this method uses up less memory. Among the new features the most notable are Landbuild and a ripple function.

> **"BlackBoard is far from a finished product – however, when it does run correctly it becomes an incredibly powerful tool."**

Ripple performs the same function as the ADPro and ImageFX tools. It distorts an image in such a way as to give the impression that image has been turned to liquid and then rippled. As version 3 as support for Arexx the author has added an example script that alters the phase of the ripples over period of time. This gives the impression of moving waves.

Landbuild is a fractal landscape-generator much like VistaPro or Scenery Animator. As well as creating its own fractal-based landscapes the program can also load DEMs (Digital Elevation Maps). However, it is far from a finished product and there are quite a few bugs. I was unable to use it as a sub-prog but had limited success running it as a stand-alone.

BlackBoard has even more powerful features but, unfortunately, it also has increased its number of bugs. However, when it does run correctly the program becomes an incredibly powerful tool.

Program Rating 91%

IMAGESTUDIO

Graham Dean, 14 Fielding Ave, Poynton, Stockport, Cheshire, SK12 1YX

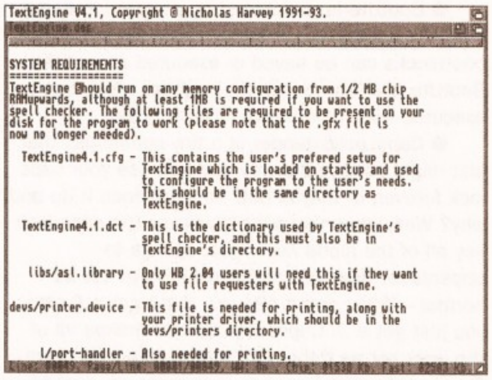
This young contender looks quite sprightly compared with BlackBoard – it barely fills a single floppy, including its example images. Judging by the interface, the program seems to have been heavily influenced by ADPro 2.5. The interface consists of a main preview window and several smaller ones for convolutions, effects and adjusting

> **"ImageStudio is an impressive program – all the more so considering that this is its first revision."**

from Japan. The cat has accidentally been left in England. Charley bumps into him and the two of them soon become the best of friends. After meeting up, the two have a number of run-ins with one of Charley's old enemies – a dog.

This gives rise to plenty of good excuses for karate chops and kicks aplenty. With the dog being on the receiving end, of course. After several beatings, a bruised and battered dog happens upon a wanted poster with a picture of the Japanese feline. Inspired by greed and the need for revenge, Charley's canine adversary decides to turn in the Japanese cat for a reward. However, he doesn't get the chance to carry out his dastardly plan...

We'll that's the storyline, now on to quality of the animation. I'm afraid this outing of Charley's doesn't compare favourably with his previous one. It seems to be a little stiff and lacking a little in



Composing letters to your friends and adding the finishing touches to your latest novel has never been easier with TextEngine 4.1.

the smoothness of its comical flow. The characters and the scenery are not as well-drawn or detailed as before. However, it is still a good animation, although not as good as Mr Whitaker's last effort.

Product Rating 79%

AUTOBOOT

Colin Yarnall, 93 Manchester Road, Wilmslow, Cheshire

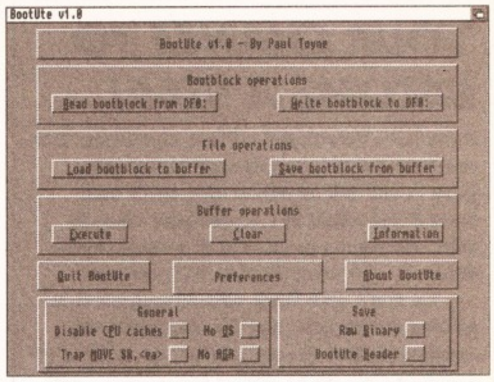
One of the first problems most people encounter when they begin to use their Amiga seriously is how to create a bootable disk. The number of files and directories that need to be included on a disk can be quite bewildering. What libraries do you need? Which Dev files should be included and what programs need to be in your C directory?

Autoboot is a program from Colin Yarnall that aims to make the process as straightforward as possible. AutoBoot will create all the necessary directories and copy across vital files and programs. It's a simple program, that has several options as to what sort of things should be included on the disk when it is created. These options include the volume's name, a trash can and a Shell icon.

Once you have set your options, you can simply click on the Create Auto-Booting Disk. Doing so will bring up a window that gives you a report on which files are being copied across. Once this is finished you'll have your very own bootable floppy disk. This disk will have 625K spare for adding your own files and programs.

This is quite a useful program that can save a lot of time as well as helping out beginners. However, I do think that five pounds is a bit much to ask.

Program Rating 87%



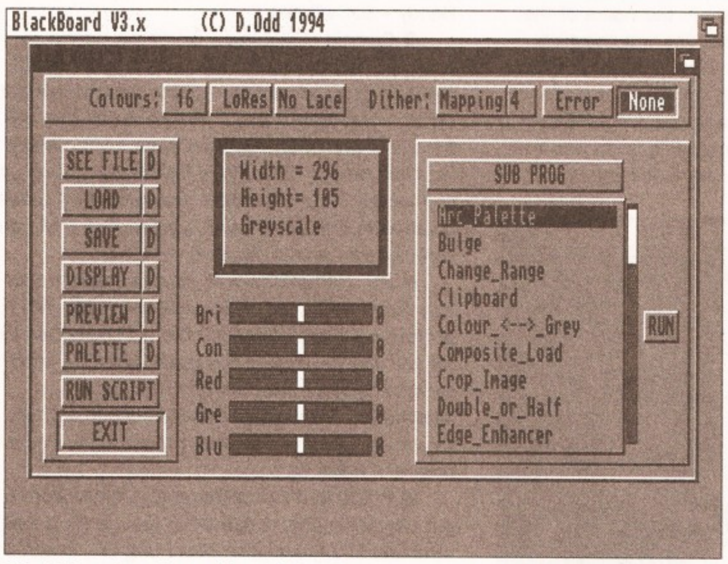
Troubled by troublesome bootblocks? Then why not try BootUte – it can take care of them with no trouble at all.

TEXTENGINE 4.1

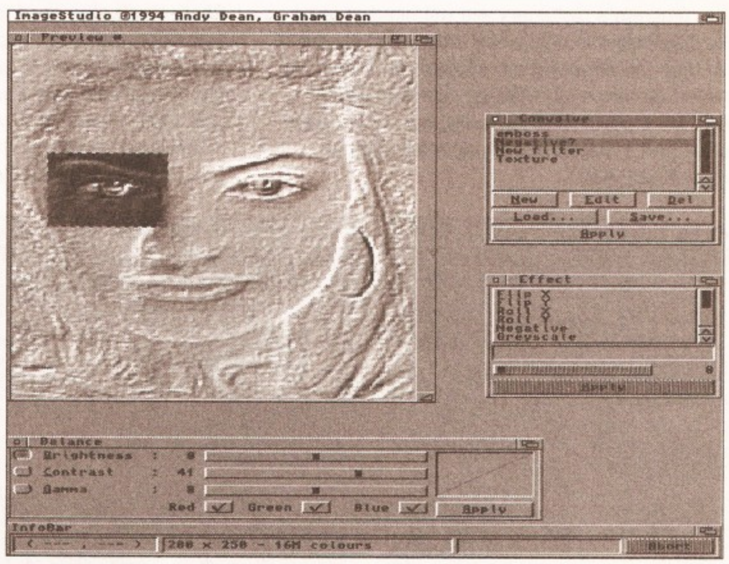
Cynostic

One of the most popular computer activities is writing. Whether it's a letter to a friend or writing your next best-seller, there are plenty of advantages to using a computer instead of more

"TextEngine's interface is pleasantly simple and gives the impression of being a no-nonsense package."



BlackBoard's rein as king of the PD processors may be coming to an end. Read the head-to-head review to find out why.



ImageStudio is an up-and-coming challenger to BlackBoard. But, has it got enough firepower to dislodge the champ?

the image's balance. It also makes use of several pull-down menus to grant access to its other features.

ImageStudio is shareware and the registered version of the program can be purchased for £10. The only limitation the unregistered version has is that it can only load images that are no bigger than 250x250 pixels. The full version is able to handle images up to 32,000x32,000 pixels and will include a 68020+ optimised version of the program.

Two of ImageStudio's most impressive functions are its limited selection and custom convolution tools. Being able to make limited selections gives you the chance to combine effects. This ability can be used with striking effectiveness. Being able to create your convolutions means you have an endless numbers of effects. You can generate a new affect by altering values of a convolve matrix.

ImageStudio is an impressive program, all the more so considering that this is its first revision. It's a good solid program with more than a few good features that, while not particularly fantastic in nature, are good to have – such as multiple undos and redos. I like this program and though it just loses out to BlackBoard, it was a very close match. The main reason BlackBoard comes out on top is that it simply has more features and more powerful ones. ImageStudio, however, is more reliable and easier to use. It has also won a place on our coveted Subscribers' disk.

Product Rating 90%

YOUR CHANCE TO BECOME A STAR!

If you have discovered a PD or shareware that you have become totally enamoured with, write in and tell us about. But, don't stop there if you would like to see your name in print. We want you to send in a small review of one of your favourite new PD package.

We don't care what type of program it is, as long as it's good and you can justify its excellence. But, please, *please*, no reviews of SwinSuit Chix 58 or similar slideshows – just serious reviews of serious products for serious readers.

If that's not enough, we'll even pay you if it's a *really* well written review!

Send your review as an ASCII text document, along with a copy of the program, to:

I WANT TO BE A STAR

Graeme Sandiford,
Amiga Shopper,
30 Monmouth St,
Bath
BA1 2BW

traditional methods such as using typewriters or writing by hand. Using a word processor allows you to save and edit files and even help make organising your words easier. TextEngine 4.1 is the latest incarnation of this popular shareware word processor.

TextEngine can be used on any Amiga with 1/2Mb of RAM. However, if you want to make use of the program's dictionary you will need at least 1Mb. TextEngine is only a tiny little program, about 35K, that can either be run straight from floppy or installed to hard disk. However, the installation needs to be performed manually, but it's no great chore – just a matter of copying a few files to certain directories.

TextEngine's interface is pleasantly simple and gives the impression of being a no-nonsense package. Below the text window, where you type in your text, there is an information bar that will inform you which line and page you are on. It will also keep you appraised of how much Chip and Fast RAM you have spare.

All of the program's features are accessible from pull-down menus. TextEngine has a couple of options when it comes to loading and saving files. You can append a file to the currently opened one and export files as ASCII, which is an important feature for any word processor. The program also has a sleep function that will close TextEngine down to a small bar on the desktop while retaining the file that's being edited.

TextEngine also has all the usual style tools, so it can make portions of text bold, italic, underlined, superscript and others. You can also cut and paste blocks of text. The program has a quite substantial dictionary which has 36,000 entries.

Overall, the program is very easy to use and you don't find yourself bogged down with too many buttons. However, there is very little to distinguish this package from its competition other than its professional looking interface.

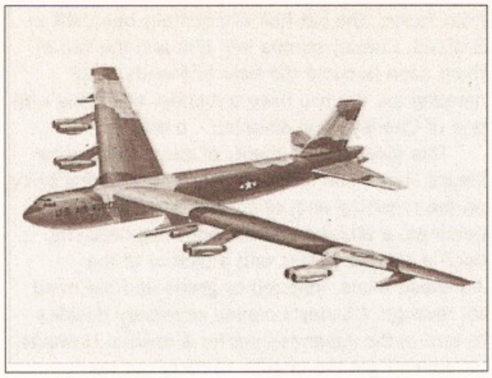
Program Rating 81%

VARK'S CLI UTILS NO.6

Roberta Smith DTP

The number of utilities that Vark manages to get on to a single floppy never ceases to amaze me. But, here is yet another disk stuffed full of programs. As usual we can't cover every program, so we'll just bring out the highlights.

● First up is AHelp, it's an on-line help system for AmigaDOS. To use the program you can add it to your C: directory, then just type its name from Shell. You'll also need to type in the name of the command you need help with. The way in which this program works is quite simple. There is a text file called Help.library, which you need to place in your LIBS: directory, it contains the AmigaDOS commands as well as the instructions on how to use them. This means you can to the list of



The Australian clip-art collection has half a dozen of such aeronautical beauties and 13 land vehicles too.

commands yourself. It's a simple tool, but one that's quite effective. However, for some strange reason, it takes delight in crashing my 1200.

● BootUte is an interesting program that can read the bootblocks of floppy. Once loaded, these bootblocks can be saved or executed as needed. BootUte is a Workbench 2+ program which can be executed from Workbench or from Shell.

● CapsLockExtender is a tiny commodity that just might change the way that you use your caps lock forever, or maybe not. So what does it do and why? Well, when you normally press the caps lock key all of the alpha keys, abc, change to uppercase. However, all the other keys act as normal – if you press <3> you don't get a £ sign you just get a 3. CapsLockExtender makes all of the keys act as if the shift button was held down. This is only useful in some instances as a lot of programs don't differentiate between these different states. However, some programs act differently, for example some word processors will delete a whole word if you press <shift><delete>. Handy – sometimes.

● CombineANIM is an extremely useful program. You know how irritating it is when you create a good animation and you want to send it off to a friend on a floppy disk, but find that the file won't fit? Trouble is, that even if you save it as two files on two disks, your friend will end up with two halves of an animation. CombineANIM offers a solution to this dilemma. It's a program that can combine two anims into one. Neat, eh?

● DU, or DiskUsage to its most personal of friends, is a tiny program – just under 1K. Yet, it performs a useful function. It's a CLI-program that will tell you the size of any given directory and the sub-directories it may contain. Having this information available is particularly useful if you would like to copy a directory to a floppy, but are unsure if it will fit.

● EzSay is a replacement for Commodore's old Say command. It has been around for a long time and EzSay's author, Wai Hung Liu, decided to write an improved version. EzSay can be run from Workbench or Shell and opens its own window on your desktop. The window contains sliders and toggleable buttons to control the way the voice will sound. If you've not heard Say or similar programs, it sounds a lot like the computer voice that Stephen Hawking uses to speak with. You can change the way it sounds by altering the pitch, frequencies and the values of things I don't quite understand. You can also choose between a male and female voice – although nobody in the office could tell the difference.

● If you are a bit of a Trekky, read on – if not, skip this part as you might find it more than a little sad. KlingNum is a program that will translate



Tired of your old Workbench backdrops? Then why not add a spot of colour with Magic Wb Extras II.

numbers into Klingon. It can be executed from Shell or from Workbench. You need to enter the number you want to be translated as an argument. An output window will open containing the figure written in Klingon. For example, if you entered 24, the window would display cha'maH loS – how you would pronounce it, I've no idea.

Well, those are some of the highlights of this disk. Once again, Vark has managed to put together an excellent collection of programs.

Product Rating 86%

MAGIC WB EXTRAS II

KEW=II

By now you are probably thoroughly bored with the way your desktop looks. If you are you may have already gotten hold of Magic Workbench. This disk is a collection of pretty icons and wonderful backdrops to be used with Magic Workbench to spruce up your desktop.

> "The quality of the files are very impressive and they are all in colour."

This disk has a number of new icons for several programs, including ADPro, ImageFX, Virus_Checker, ToolManager and several others. To use them you simply need to copy them across to the same directory as the program who's icon you wish to replace.

The backdrops, or Wallpaper, are also in plentiful supply, there are forty in all. They are actually standard iff files that can also be used with Workbench 3's WBPattern prefs. They are pretty good too and you should find something to your liking. As a whole they are very arty, but also fairly varied – you'll find everything from a conservative marble, to Ren and Stimpy and even a Sonic the Hedgehog.

It's a good collection and some of the patterns are particularly so. So if you are searching for a new look to your desktop, you will be well advised to take a look at this collection.

Product Rating 89%

AUSTRALIAN CLIP ART

Now here's an interesting disk. I wasn't quite sure what to expect from the contents, but it turns out to be a collection of images that cover aircraft and cars. The term cars actually covers a number of different forms of land transportation, including buses and even horse-drawn carts.

The quality of the files are very impressive and they are all in colour. They appear to be hand drawn and painted pictures that have been scanned. They have been saved as lowres interlaced HAM IFFs and can be loaded into just about any Amiga paint package. They have a surprising amount of detail for images that only have a low resolution. They are crisp, clear and very colourful.

This disk contains images of six aeroplanes and 13 "cars". While the images are of a high standard, they will obviously only appeal to people who need an image of a plane or a car. So, if you are looking for some nice colourful images of cars and planes, this disk may be just what you are looking for.

Product Rating 84% AS

GET IN TOUCH

If you have discovered, or written, any PD, shareware or licenseware that you feel is pretty special, then please send it in for review. If you are a shareware author, please send in the registered version of the program.

Also, if you have any suggestions or comments about this section of the magazine, please write to:

Graeme Sandiford
Amiga Shopper
30 Monmouth Street,
Bath BA1 2BW

GET TO THE TOP IN THE PD CHARTS

If you run a PD library and would to tell the world about all the wonderful goodies that are simply bursting out of your disk boxes, send in a list of your top ten utilities and animations.

In every issue we include the chart below to give our readers the opportunity to find out which products are popular with their fellow readers. If you want to tell us what your top-ten PD list looks like, write to:

Graeme Sandiford
Amiga Shopper
30 Monmouth Street,
Bath BA1 2BW

TOP TEN PD CHART – IT'S THE ONLY CHART THAT COUNTS

This month we continue our quest to keep you up-to-date with the most popular PD at the moment. We give you a list of the top ten programs and disks that have been ordered from two PD libraries. It gives you a chance to see which programs are popular with your fellow Amiga-users.

	Cynostic 0203 613817	KEW=II 081 657 1617
1	FinalWrapper	Workbench 3 Utils
2	TextEngine	ZXam Spec
3	Virus Workshop 4	ReOrg
4	Imagine Buddy System	Magic Workbench
5	Movie Guide	DMS
6	A64 Emulator	Magic Workbench 2 Extras
7	ImageStudio	Bombpack 32
8	Term 4.1	DiskSalve 2
9	MainActor 1.53	MapMaker 2000
10	Viewtek V1.5	SuperDOC 2.1
	25 Monk's Road, Binlay Woods, Coventry, CV3 2BQ.	P.O. Box No.672, South Croydon, Surrey, CR2 9YS.

PD HOUSES PD HOUSES PD HOUSES

17 Bit Software, 1st Floor Offices, 2-8 Market Street, Wakefield, West Yorkshire, WFI IDH. Telephone (0924) 366982, Fax (0924) 200943. Catalogue .50p or free if you send an SAE. Accept phone orders, credit cards and direct debit. Open 8am–8pm Mon–Thur, 9am–5.30pm Fri–Sat.

A1200 Only PD – BJ Cowdall, 23 Barn Way, Cirencester, Gloucestershire GL7 2LY. Try to obtain all AGA PD and WB3 utils etc. Catalogue is £1.00 or send a disk and an SAE. No phone orders or credit cards. For a printed catalogue just send an SAE. Disks are £1.00 each. Frequent special offers!

Active Software, PO Box 151, Darlington, County Durham DL3 8YT. Telephone & Fax (0325) 352 260. EMail Bux8@unn.ac.uk. Specialise in professional collections, compile disk packs, essential Aminet compilations and sound samples. Catalogue is 50p. No phone orders, no credit cards or direct debit. Open 9am–9pm. Discounts to User Group members.

Activity Software, 393 Doncaster Road, Rotherham, South Yorkshire, S65 2UF. Telephone (0709) 377730. Catalogue 1st class stamp. Do not accept phone orders, credit cards or direct debit. Open from 9am - 5.30pm Mon to Sat. Additional info, also stock PC Shareware. Crazy Joe's, 141 Effingham Street, Rotherham.

AGA Exchange, 18 Brownshill, Cromer, Norwich, Norfolk, NR27 0QA. Specialist areas: AGA PD/Shareware full advice service, PD exchanges, Laser printing service. Catalogue free (with s.a.e. + disk). No phone orders, credit cards or direct debit. Half price membership (£4.50) until 1/11/94.

AmiCom PD, 22 Church View Close, Havercroft, Wakefield, WF4 2PH. Catalogue .50p. Do not accept phone orders, credit cards or direct debit.

Amiganuts, 3 Spring Road, Bitterne, Southampton, Hampshire, SO19 2BH. Specialist areas: Acc, Accm, Words 4, general software and titles produced by M. Meany. Catalogue, .50p + s.a.e. Do not accept phone orders, credit cards or direct debit. Open 24 hours a day, 7 days a week. New ownership.

Anglia PD, 30 Victoria Steet, Felixstowe, IP11 7EW. Telephone (0394) 283494. Catalogue .70p. Accept phone orders, credit cards and direct debit. Open 9am - 5.30pm.

Anim 1 PD, PO Box 128, West Malling, Kent, ME19 6UA. Telephone none. Specialise in Animation graphics. Catalogue cost .60p. No: phone orders,credit cards,direct debit.

Asgard Software, 20 Langdale Drive, Flanshaw, Wakefield, W Yorks WF2 9EW. Telephone (0924) 363 059. Specialise in all types of Amiga PD (approx. 4,000 disks in library). Catalogue is £1.00. No phone orders, no credit cards or direct debit. Open 24 hours.

Barkin Mad, 18 Rhyber Avenue, Lanark, Lanarkshire, ML11 7AL. Telephone (0555) 663530. Catalogue FREE when sending a s.a.e. and/or disk. Accept phone orders. Do not accept credit cards or direct debit. Open 24 hours - 7 days. We fully encourage swapping PD as well as selling to try to spread good quality PD as far as possible.

Beats Brothers PD, 6 Brownings Close, Pennington, Lymington, Hampshire, SO41 8GX. Specialist areas: Amiga games and utilities. Catalogue £1.00 inc P&P. Do not accept phone orders, credit cards or direct debit. The catalogue disk will be released in August 1994.

Belshaw's Computers, 55 Balderton Gate, Newark, Notts. Telephone and Fax (0636) 72503. Catalogue FREE. Accept phone orders. Do not accept credit cards or direct debit. Open 9.30am to 5.30pm. Retail outlet, customers can call at shop.

BGPD, 6 Peter Street, Whitehaven, Cumbria, CA28 7QB. Specialist areas: I can supply any title reviewed in any Amiga magazine. I always have the latest assassin collections. Catalogue .50p or send a blank disk. Do not accept phone orders, credit cards or direct debit. I can also supply many second hand (commercial) games + utilities, and I can provide a PD document printing service.

Blitz basic PD, 30 Riding Dene, Mickley, Northumberland, NE43 7DL. Specialise in Blitz Basic created PD. Catalogue is £1.50. Open 9am–5pm. Orders processed within 48 hrs. Also produce a diskmag for Bliz users.

Chris's PD, 22 Merryfields Avenue, Hockley, Essex, SS5 5AL. Telephone (0702) 203826. Chris's PD disk catalogue .70p, 2 disk Fred Fish catalogue £1.40, both Chris's PD & Fred Fish disk catalogues £2.00 or Free if you send s.a.e. with sufficient disks. Do not accept phone orders, credit cards or direct debit. Open 6pm-8pm Weekdays, 10am-4pm Saturdays. All disks are virus free & error free. All disks only .80p each.

CAM-PD, 26 Crowland Way, North Arbury, Cambridge CB4 2NA.

Club 1200, 57 Europa Rd, Lowestoft, Suffolk NR32 4BQ. Telephone (0836) 328 263. Specialise in AGA and WB3 only. Catalogue is £1.00. No phone orders, no credit cards or direct debit. Open 9am–7pm Mon–Fri. One disk free for every five bought.

CPU Computer PD Library, 120 High Street, Chatham, ME4 4BY. Tel + Fax: 0634 826 218. Catalogue cost £1.00. Open 9.30am–5pm Mon–Sat.

Craig Holmes Non-Profit PD, 23 Rocester Avenue, Wednesfield, Wolverhampton, West Midlands, WV11 3AU. Telephone (0902) 305209. Specialist areas: latest virus checkers. Catalogue, free listing upon request. Do not accept phone orders, credit cards or direct debit. Open, mail order only - but phone enquiries 9am-8pm, 7 days a week. Additional info, all discs £1.75 inc p&p. Bulletin board available on Sunday 2pm-5pm only.

Cynostic, Office 01, Little Heath Industrial Estate, Old Church Road, Coventry, CV6 7NB. Telephone (0203) 681687, Fax (0203) 638508. Specialist areas: all latest demos, comprehensive utility section and complete coverage of the PD spectrum. Catalogue nil for paper, £1.00 for catalogue disk. Do not accept phone orders but will within 6 months. Do not accept credit cards or direct debit. Open 10am 6pm. We offer total product support, plus we can advise on any Amiga problem.

Dead Budgie PD, 53 East Street, Ashburton, devon TQ13 7AQ. 70p for two disks. Don't accept phone orders, nor credit cards or direct debit. They accept postal orders or cash – cash is sent at your own risk however.

Deck The Ripper of NFA PD, 173 Trevind Drive, Rushey Mead, Leicester LE4 7TR. Telephone (0533) 661 610. NFA productions are setting up a network of PD houses across the UK in an effort to get PD to the public as cheaply as possible.

Epic Marketing, Victoria Centre, 139 - 139 Victoria Road, Swindon, Wiltshire, SN2 3BU. Telephone (0793) 490988, Fax (0793) 514187. Specialists areas, desktop video fonts and tutorials. Catalogue £1.00. Accept phone orders and credit cards. Open 9.30am - 5.30pm Mon to Sat.

Essex computer systems, Freepost CL2875, Southminster, Essex, CMO 7BR. Telephone (0621) 778778. Specialise in Licenceware (central licenceware register C.L.R. organiser). Catalogue FREE. Phone orders accepted. Accept credit cards/direct debit. Open 10am - 6pm Mon to Fri. Members of the Professional standards for software distribution.

Eurodisk PD, 71 Phillimore Place, Radlett, Herts WD7 8NJ. Catalogue cost £1.00 (free if disk + SAE is encl).

F1 – Licenseware, 31 Wellington Rd, St Thomas, Exeter, Devon EX2 9DU. Telephone (0392) 493 580. Catalogue is 50p. No phone orders, no credit cards. Open 9am–9pm.

Fantasia PD, 40 Bright Street, Gorsehill, Swindon, Wiltshire, SN2 6BU. Telephone (0793) 610134. Specialist areas: Slideshows, 3D rendered images (jpeg) serious software. Catalogue .70p + .40p P&P or blank disk + S.A.E. Accept phone orders. Do not accept credit cards or direct debit. Open 24 hours. We are a non profit PD house with all proceeds going back into the PD house.

Five-Star PD, 48 Nemesai, Amington, Tamworth, B77 4EL, U.K. Telephone (0827) 68496. Specialist areas: education utilities, DTP games. Catalogue .70p + Free P&P. Do not accept phone orders, credit cards or direct debit. Open 9am 0 2pm 7 days a week. All disks .99p + Free disk when buy 10 or more.

GD PD, 99 Turnberry Rd, Great Barr, Birmingham B42 2HP.

G.V.B. - PD, 43 Badger Close, Maidenhead, Berkshire, SL6 2TE. Telephone (0831) 649386, Fax (0628) 36020. Specialist areas: all types. Catalogue 3 x 1st class stamps. Do not accept phone orders, credit cards or direct debit. Open 9am to 7pm. All disks £1.00 inc p&p with a valid account number, first disk £1.50.

GD PD, 99 Turnberry Rd, Great Barr, Birmingham B42 2HP.

Gothik, 7 Denmark Road, Northampton, NN1 5QR. Telephone (0604) 22456. Specialist areas: Blitz Basic 2 programming + PD. Do not accept phone orders, credit cards/direct debit. Open Sat 10am to 5pm. We were Batty's PD Club, but are now concentrating on Blitz Basic 2 users.

Homesoft PD, C. Horne, 23 Stanwell Close, Wincobank, Sheffield, S9 1PZ. Telephone (0742) 492950. Specialist areas: Amiga PD over 11000 disks, CD ROMS. Catalogue, Free if a s.a.e. + disk are sent. Do not accept phone orders, credit cards or direct debit. Open from 9am till 6pm.

ICPUG (Independent Commodore Products Users Group), 45 Brookscroft, Lindon Glade, Croydon, CRO 9NA. Telephone 081/651/5436, Fax 081/651/3428.

Immediate Arts, 26 Lyndhurst Gardens, Glasgow, G20 6QY. Telephone 041/946/5798. Catalogue, catalogue disk £1.00 (p&p inc). Do not accept phone orders, credeit cards or direct debit. Open 9am to 6pm.

JJPD, 48 Bewick Drive, Bakersfield, Nottingham NG3 7GB. Tel: 0602 877 528. Specialise in utilities. Catalogue cost 75p inc. P+P. Open Mon–Sun 9.30–4.30. All PD 99p. Hardware also available. Special members discount scheme.

KEW = II Software, P.O. Box No 672, South Croydon, Surrey, CR2 9YS. Telephone 081/657/1617. Specialist areas: utilities, quality PD & Shareware, system functions. Catalogue, introduction pack inc disk £1.00. Accept phone orders. No credit cards or direct debit. Open from 8am - 8pm. Full disks pick your own files 500 K=Bootable 800 K=Unbootable.

Magnetic Fields Shareware and Public Domain Software, PO Box 118, Preston, Lancashire, PR2 2AW. Telephone and Fax, (0772) 881190. Accept phone orders, credit cards and direct debit. Open 9am to 5pm Mon to Fri. We also do PC + ST.

MegaSoft, 78 Bockingham Green, Basildon, Essex, SS13 1PF. Telephone (0268) 559164. Catalogue, send two blank disks + Stamps. Accept phone orders through Megasoft membership codes. Do not accept credit cards or direct debit. Open 9am–11pm everyday. Over 1500 disks. You name it we stock it, £1.20 per disk.

Microland Bulletin Board, PO Box 13, Aldershot, GU12 6YX. Telephone and Fax (0252) 25841. Specialist areas Internet. Catalogue, only available online. Do not accept phone orders, credit cards/direct debit. Open 24 hrs.

N.B.S. 1 Chain Lane, Newport, I of W, PO30 5QA. Telephone (0983) 529594, Fax (0983) 821599. Specialist areas: PD, CLR Licenceware, Commercial Software, Manga Video. Cataloge FREE with S.A.E. Accept phone orders, credit cards and direct debit. Open office hrs.

NFA-PD, R. Monks, P.O.Box 42, Grimsby, South Humberside, DN33 1RY. Specialists areas, The PD house is currently A1200 orientated, NON-AGA titles are available if they work on an A1200. Catalogue disk + s.a.e. Do not accept phone orders, credit cards or direct debit. Orders usually dispatched same day. Catalogue disk uses point and click and saves orders to disk, also totals order with 10%off orders £10.00 or more. Prices £1.00 per disk inc p&p, 3 disk titles (e.g Grapevine 19) - £2.80

Nemesis PD, 126 Mallard Hill, Bedford, MK41 7QT. Tel: 0234 350 654. SAE for catalogue. Also User Group.

Numero Uno, 21 Burstall Hill, Bridlington, North Humberside, YO16 5NP. Telephone (0262) 671125. Specialise in a lot of A1200 stuff - beginners welcome. Catalogue costs a blank disk or 1st class stamp. Phone orders accepted buyer collects. Do not accept credit cards/direct debit. Open 4- 10pm on Wednesdays, 9am - 1pm + 6.30am - 10pm on school holidays & weekends. 75p a disk, 50p p+p.

Online PD, 1 The Cloisters, Halsall Lane, Formby, Liverpool L37 3PX. Telephone (0704) 834 335, Fax: (0704) 834 583 (phone voice line first) BBS: (0704) 834 583. Specialise in demos. Catalogue is 50p. They accept phone orders and Visa, Access, Mastercard and Eurocard. Open Mon–Sat 9am–6pm.

Orion PD, Mr Modarne, 14 Ouston Close, Wardley, Gateshead, NE10 8D2. Telephone 091/438/5021.

Paul Betteridge PD, 25 Cunningham Crescent, Bournemouth, Dorset BH11 8DN. Free catalogue.

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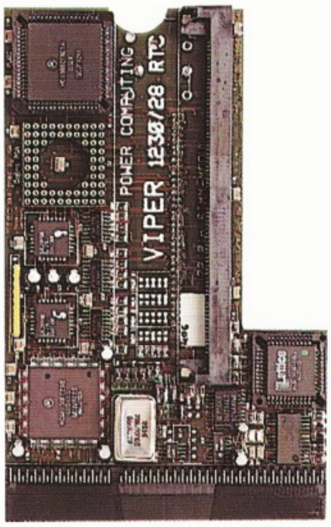
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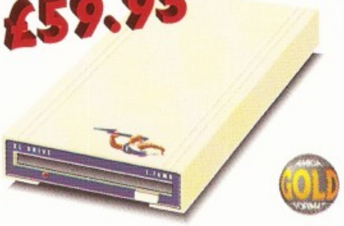
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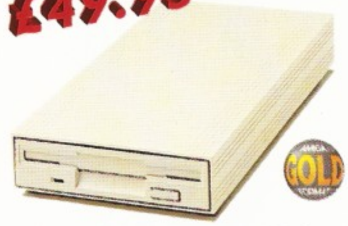
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